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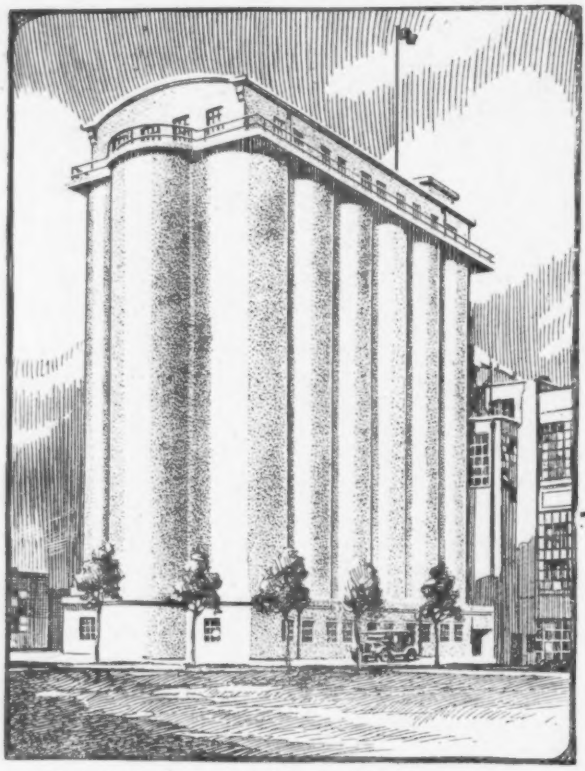

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The editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings whenever possible.

March, 1928

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Trade in 1927.

ALTHOUGH EUROPEAN economic conditions were still far from satisfactory during the past year, a considerable improvement over 1926 was noticeable. A prominent feature has been the formation of international cartels, trusts, agreements for the exchange of manufacturing processes, and the expansion of such organisations as already existed.

Last year British trade was largely affected by the coal strike of 1926 and its consequences. Imports of manufactured goods showed a large increase over 1926 and a slight gain over the more normal year, 1925. Foodstuffs imports were larger than in 1926, but considerably less than in 1925. Raw material imports dropped in value, chiefly as a result of lower prices (*e.g.*, cotton and crude rubber), but the volume apparently increased in 1927. Exports of manufactured goods, which form the bulk of British exports, were larger than in 1926, but were still much below 1925.

British producers have severely felt foreign competition; and in the latter part of 1927, the industry as a whole, urged by this keen competitive situation, put forth strenuous efforts to regain domestic and oversea markets. These endeavours took the form of business amalgamations, centralised selling, agreements as to output and prices, exchange of market information, and improved relationship with labour.

Gradually the emphasis of British industry is shifting from the old trades, with labour and capital going into the new enterprises, and these, such as the electrical equipment, motor, and artificial silk industries, had a very good year. These changes are reflected in employment figures; the principal industries showing increases in the number of workpeople employed since 1924 are: Distributive trades, 327,000; building, 173,200; tramway and omnibus services, 49,800; motor-car construction and repairing, 41,000; manufacture of building materials, 35,600; printing and publishing, 28,700; furniture making, 20,300; electrical engineering, 18,300; fishing and shipping service, 18,000; silk and artificial-silk manufacture, 17,700; tailoring trade, 14,500; electric cable, lamp, and wire manufactures, 12,600; and hosiery trade, 11,300.

On the other hand, the industries showing outstanding decreases are as follows: General engineering and iron and steel founding, 65,500; shipbuilding and ship repairing, 54,000; coal mining, 44,000; woollen and worsted manufacturers, 20,200; iron and steel manufactures, 16,600; and dress and mantle making, 11,420.

Employment.

There are now more workpeople in actual employment than before the war. The changes in the birth rates and survival rates during the past forty years have modified the age composition of the population, with a larger number of people entering industry than the number going out. This, coupled with the disloca-

tion of industry consequent on the war, has brought about the phenomenal condition that, in spite of a larger and larger number of employed persons year by year, there are over a million unemployed.

Another interesting point is, that on November 1 of last year, the average level of retail prices of the commodities taken into account in maintaining unchanged the pre-war standard of living of working-class families (including food, rent, clothing, fuel, light, etc.) was approximately 69 per cent. above that of July, 1914. However, the weekly wage rates had increased by 70 to 75 per cent. over 1914 for workpeople employed in industry and transportation; thus, there had been an increase of 1 to 6 per cent. in real wages.

Canning Convention.

The Annual Convention of the Canning and Allied Industries, U.S.A., was held during the last week of January at the Hotel Stevens, Chicago, which is a new hotel, and stated to be the largest in the world. The section of the machinery and supplies exhibit which was housed in the Grand Ball-room must have found itself in somewhat incongruous surroundings.

We note that a special feature was made of "distribution research"; addresses were given on the "Study of Hand-to-Mouth Buying," the "Preliminary Survey of Distribution," the "Canned Foods Campaign," and "What Customers Demand." The first of these was delivered by Dr. Alsberg, who has been making special researches into the problems connected with the distribution of canned foods, for the National Canners Association. Other speakers of note were Dr. Lyon, of the Institute of Economics, and Dr. Klein, who is chief of the Bureau of Foreign and Domestic Commerce. This switching over of the limelight of organised research from the technical problems of production to those of distribution is certainly sound policy, and is bound to produce results measurably beneficial to the industry as a whole. We have not yet received the full reports of the many papers which were read, and we look forward to some interesting and instructive reading.

Refrigerating Convention.

A number of useful papers were read on the occasion of the Annual Convention of the National Association of Practical Refrigerating Engineers, held in San Francisco at the end of November. We have made a note in the Current Literature section of those likely to be of interest to manufacturers of foodstuffs.

World's Dairy Congress, 1928.

This country is not without its conventions; for the first time the World's Dairy Congress will be held in Great Britain, beginning on June 26 and ending on July 16. The address of the organising secretary is 28, Russell Square, W.C.1. There will be a wealth of addresses and tours; papers will be read on milk production, milk distribution and manufacture, animal physiology in reference to milk production, milk consumption, administration and control, and so on. We note that Mr. H. E. Van Norman, President of the American Dry Milk Institute, and Professor A. Miyawaki of Japan are to lecture on dried milk, and that two Americans, Mr. E. White, President of the Ice-cream Association, and Mr. F. Rasmussen, Executive Secretary of the National Association of Ice-cream Manufacturers, are to lecture on ice-cream manufacture. Other subjects of special interest are: "Milk Transport," "Pasteurisation," "Metals, and their various influences on Milk," "The Sterilisation of Milk," and "The Disposal of Whey." It is curious to find no mention made of cheese in the programme.

Argentina and Tin Plate.

A steady growth in the consumption of tin plate is evident in Argentina, due to the increasing development of the local canning and meat packing industries. Sad to relate, our trade with that country in tin plate, which amounted almost to a monopoly, has largely passed into the hands of U.S.A. In 1925, the latter shipped 8,614 tons of tin plate to the Argentine; in 1926, the amount rose to 18,562 tons, and in the first six months of 1927 to 24,063 tons. In an effort to regain the ground lost in this trade, British shippers have recently announced a 10 per cent. reduction in prices for the Argentine market.

Bakers' Machinery Compulsory.

A decree has been issued in Poland requiring, in towns of a certain size, all establishments baking bread and pastry to install machinery for sifting flour and mixing and kneading dough. This order becomes effective in May of the present year. Apparently, the Government has been led to take this step by the unsatisfactory nature of the sanitary conditions which obtain in many of the bakery establishments. A number of offending bakeries of the smaller size have already been closed down by the police authorities.

It is stated that out of 600 of the larger bakeries in Warsaw, only about 50 are equipped with bakers' machinery. When this order becomes effective, there should be a big demand for machinery, and as local manufacturers have not, hitherto, been interested in this particular line, there should be a good opening in Poland for British manufacturers.

Malted Milk.

There would appear to be an opening in Denmark for malted milk, where, according to information contained in a recent letter to a member of the trade from Consul-General Marion Letcher at Copenhagen, the product is not yet known.

Trade in Biscuits.

The United Kingdom continues to lead in the world export trade in biscuits and crackers, with France, the Irish Free State, and the United States in close competition for the second place, followed by Germany, Netherlands, and Belgium, in the order named.

The largest customers of U.S.A. are Cuba, Canada, Colombia, Mexico, and Venezuela. The total exports have shown a decline during the last three years, and this has been attributed, in the case of Cuba, which is largely dependent upon its sugar crop, to the lowered prices of sugar and the resulting depression in purchasing power of the island. Colombia is largely a coffee country, and last year the Colombian producers not only had a poor crop, but they got a lower price for their coffee; adverse prices also affected Venezuela, added to which there has been a depression in the oil industry. Mexico has suffered from disorganisation of the oil industry and the heavy increase in tariff, causing a slump in imports. U.S.A. has, by the way, a preferential advantage in Cuba.

A very large proportion of the U.K. trade is with British Dominions, where it receives the benefit of a preferential tariff. Canada, which also benefits in the same way, has shown a slight increase in exports of biscuits; practically all of Canada's exports are to U.S.A. and to British possessions.

Germany's trade is largely with neighbouring countries, with imports about half as much as the exports; that of France is largely with its own colonies. The trade of the Netherlands, and of Belgium, is mainly confined to neighbouring countries and to colonial possessions.

Vitamins and Canned Foods.

Mr. R. J. Munro has drawn our attention to the fact that Messrs. Angus Watson and Co., Ltd., of Newcastle-upon-Tyne, the well-known preservers, carried out a lengthy series of feeding experiments, lasting over two and a half years, upon processed meat and fish products packed both in cans and in glass jars. The results showed that the processed goods were remarkably rich in vitamins A, B, and D, comparing favourably with the vitamin content of fresh milk and fresh green cabbage.

The full results of this research were published in the *Journal of the Society of Chemical Industry*, May 21, 1926.

Delicatessen Stores.

Some of the views put forward by Mrs. Callow on another page have been echoed on the other side of the water by Mr. Henry Lohman, a retail grocer of Greater New York. Mr. Lohman has discussed the changes being brought about by the multiplication of delicatessen stores. These cater to sections where population is most dense, and in the larger cities they find their chief patronage from dwellers in apartment houses, who buy small quantities at a time, but make frequent purchases. A delicatessen stores might be described as a thoroughly up-to-date grocer's shop, minus the heavy goods. At short notice the delicatessener (?) can furnish a complete meal to take home, and do so more economically than the housewife can prepare it herself. She can select a wider variety, and buy just for her needs, whereas she would have to buy a large quantity of each article if she did the cooking herself.

This idea of buying just the quantity as needed, with no carry-overs for the next day, is taking hold of people. It makes itself evident in the increasing call for smaller joints and smaller hams; and, in the latter case, efforts have been made to go a step further by putting up sliced ham in glass containers, but no way has yet been found of sterilising the ham without detracting from its quality.

Pickles and Spices.

In a contribution to *The Fruit Products Journal*, F. W. Brown advocates the use of essential oils in relishes, pickles, sauces, purees, and other products. The principal reasons for replacing spices by spice oils are: greater uniformity of quality and flavouring values, no colour disturbances, less bulk in storage, less weight in shipping, no danger of moulding, no loss from exposure in packages, no introduction of starch in the mixtures, ease of handling, less cost as compared with equivalent spice values, and, lastly, entire flavour available immediately.

The following methods of using spice oils are suggested:

For flavouring pickling vinegars, try 10 to 15 minims of a spice oil or mixture of oils added to each gallon. Rub the oil in some salt or sugar to permit a large surface to be exposed to the solvent action of the fluid. Stir well, let it stand a few hours, or over night. Then draw off the clear flavoured liquor.

For relishes and kindred products, one to two ounces of flavouring oil may be taken up on salt or sugar, or both, then mixed into a batch of 100 lbs. or more, as taste of clientele directs.

For meat products, the quantities of spice oils used will vary considerably, from a few drops to one or two fluid drachms to 100 lbs. of mixture. The oil is applied by absorbing with pepper and salt (rubbing up in a mortar or pan) until a uniform and fairly dry product is obtained. This is then dusted over the meat, mixed and ground.

Mayonnaise.

The Food Standards Committee of the U.S. Dept. of Agriculture has proposed the following definition and standard for mayonnaise:

Mayonnaise, mayonnaise dressing, mayonnaise salad dressing, is the clean, sound, emulsified product composed of edible vegetable oil, egg yolk or whole egg, a vinegar and/or lemon juice, with or without one or more of the following: salt, other condiments, sugar, edible stabilising material. In its preparation are used not less than 60 per cent. of vegetable oil, and not less than 6 per cent. of fresh egg yolk free from white, or the equivalent thereof in egg yolk solids contained in commercial egg yolk, dried egg, dried egg yolk, or whole egg. In the finished product the sum of the percentages of vegetable oil and fresh egg yolk free from white is not less than 78; and the quantity of any stabilising material used does not exceed 0·5 per cent.

Fruits in Ice-Cream.

During the past few years, a thorough examination of the methods of preparing fruit ice-cream and water ices has been carried out at the Fruit Products Laboratory of the University of California, and standardised methods have been developed for using fresh fruits and berries, canned fruits, fruit preserves, jams, and fruit juices and syrups in ice-cream. It will be recollected that this laboratory recently developed methods of preparing several new prune products.

Fish Research Station.

It is highly satisfactory to find that a research station of considerable size is to be established at Aberdeen, where investigations into the better preservation and marketing of fish, and other matters of importance will be carried out.

News comes from Newfoundland of a scheme for exporting cod and other fish to the British and American markets in a fresh condition by the brine freezing process, utilising fast refrigerated steamships.

Nomenclature of Protides.

The question of introducing certain changes in the nomenclature of biological chemistry has been the subject of an inquiry by a committee of the International Union of Pure and Applied Chemistry. A meeting of this committee was held at Warsaw in September, 1927, when the following decision on the nomenclature of Protides was unanimously approved for submission to the various national committees for study and final adoption at a future meeting of the Union:

1. The name *proteides* is proposed for designating the protides which give on complete hydrolysis amino acids accompanied or not by other substances.

2. The proteides are divided into *holoproteides* and *heteroproteides*.

3. The *holoproteides* are the proteides which give on hydrolysis only amino acids and ammonia. They may be divided into subgroups according to the Anglo-American proposals: (*a*) *protamines*, (*b*) *histones* (this should be changed to *histonines* in conformity with the rules of organic nomenclature), (*c*) *albumines*, (*d*) *globulines*, (*e*) *glutenines*, (*f*) *gliadines*, (*g*) *scleroproteines*, and (*h*) *keratines*.

4. The *heteroproteides* are the proteides which give by hydrolysis amino acids accompanied by other substances. They may be divided into the subgroups (*a*) *nucleoproteides*, (*b*) *mucoproteides*, (*c*) *chromoproteides*, and (*d*) *phosphoproteides*.

The Armour Laboratories.

Recently the Chicago laboratories of Armour and Company have been moved into a new building situated at the centre of this company's factories. The main laboratory, where all the analytical control work is carried out, is of remarkable size, and is provided with hardwood floor and soundproof ceiling. The office, library, and a number of chemical and bacteriological research rooms occupy the entire north side of the same floor. Experimental animals are housed on the top floor of an adjacent building, where the milling and preparation of samples are carried out.

Baker Perkin Developments.

The American Press announces that the affiliated firms of Baker Perkins, Ltd., of London, and Savy Jeanjean et Cie, of Paris, which have been working under a co-operative arrangement by which they have pooled their technical research and sales activities, are planning to enter the American market this year. With this announcement is coupled a tribute to these firms: "The Baker Perkins Co., Ltd., of London, and their associated American company are the largest builders of chocolate and confectionery and baking machinery in the world; and now that they are allied with Savy Jeanjean et Cie, of Paris, who are the leading manufacturers of chocolate and candy equipment in Europe, the news of their coming into the American market has an important significance to this industry."

The French firm is reputed to be the first builder of chocolate machinery, and the originators and co-inventors of the enrober. M. R. Savy is making a tour of the leading chocolate and confectionery factories in America, studying market requirements and conditions. Mr. A. F. Miller, who has represented John Werner and Sons, of Rochester, N.Y., for the past twelve years, has been appointed to an important position on the sales staff, and, after a visit to headquarters in London and Paris, will take up duties at the general sales offices of Baker Perkins Co. in New York.

Colouring Matters in Food

By F. W. ANDREWS,
British Dyestuffs Corporation, Limited.

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We give below the second of a series of important articles on colouring matters for foodstuffs. These articles, representing the fruits of many years of specialised experience, set out, in a manner readily understandable by all, the general rules and finer points to be observed by the user in applying colours to foods and, equally important, point out the pitfalls and dangers to be avoided. The application to the various confectionery and meat products is dealt with in detail. Finally, the author will discuss the question of purity in relation to food-colours.

PART II

IT WILL be my endeavour in the following remarks to point out the many difficulties with which I come into regular contact, and to give a little guidance which will enable the manufacturer to escape the pitfalls that abound in using such complicated products as synthetic dyestuffs. For this purpose we will divide foodstuffs into three main classes:

1. *Confectionery.*—To include sweetstuffs, cakes, biscuits, custard powder, jams, jellies, glace cherries, icing sugar, mineral waters, and similar sugar products.

2. *Meat Trade.*—In which are included all products made from meat, such as sausages, polonies, black or Bury puddings, brawn, potted meat, and paste.

3. *Fish Trade.*—Colours for kippers, haddocks, and fillets.

Confectionery

Sweets.—One of the chief causes of fading in sweets, apart from light and heat, is due to the introduction of glucose by the sugar-boiler with the object of making an invert sugar, and as sulphur dioxide is often used by the glucose manufacturer as a bleach, sufficient traces of it are found in the sweetstuff to cause the fading. Orange I should not be used unless the sugar is acidified before the addition of the colour. The most suitable colours for sweets are as follows:

Tartrazine.	Rhodamine.
Ponceau 3R.	Carmoisine.
Ponceau 2R.	Indigo Carmine.
Amaranth.	

Custard Powder.—The object of the custard powder manufacturer is to use as little colour as possible to produce the desired result, and the only colours which should interest him are the most concentrated he can obtain. In this way a smaller amount of colour is necessary in his master batch, and a large amount of specking thereby obviated. Undoubtedly the most suitable colour for this purpose is Tartrazine, and although Acid Yellow G is used to an extent, this, as previously stated, is reddened considerably in the presence of acid or any fruit juices and is not a safe colour to use. In the writer's opinion, for blending with Tartrazine in custard powder, Ponceau is a more suitable colour than Orange I, and the physical appearance of the cornflour is generally more pleasing when the former colour is used.

Jam.—For brightening raspberry, strawberry, and other red jams, Ponceau is the best colour, and for other classes of jam, Tartrazine, Amaranth, Orange I, Orange II, Carmoisine, and Indigo Carmine may be used.

Glace Cherries.—Considerable difficulty is often experienced here owing to the large amount of sulphur dioxide present in the cherries when they are imported into this country. The manufacturer usually endeavours to remove as much as possible by steeping the cherries before boiling in the syrup, but there is generally sufficient left behind to bleach any of the colours which are susceptible to SO_2. The best colour for glace cherries is Erythrosine, or, alternatively, dyeing with Ponceau after the SO_2 has been "killed" in the manner previously described.

Mineral Waters.—The chief cause of trouble with colours in mineral waters is settling out, and only those which are able to stand up for a considerable length of time are satisfactory for this purpose. Those chiefly used are Tartrazine, Ponceau, Amaranth, and Carmoisine. With blended colours, care must be taken to see that the shade is maintained when the concentrated solution is broken down to the required tint. A blend, say, of Tartrazine and Ponceau may give quite a good orange shade when used in a fairly strong solution of about 1 in 100, but at 1 in 5,000, or even weaker, alterations in shade occur. The only satisfactory orange colours for standing up in solution, which have come to the writer's notice, are Acid Orange GG or Chrysoidine, but up to the present we know of no pure products of this kind being offered. All colours used must be perfectly acidproof, and it must also be remembered by the mineral water manufacturer, and those firms which make up colour solutions for sale for this purpose, that the maximum solubilities vary considerably with different types of dyestuff. It can be taken as a general rule that none

of the colours mentioned previously will remain in solution over a proportion of 4 or 5 per cent. Above this amount a settling out will occur, due to super-saturation, but by increasing the viscosity with glycerine or some similar product this percentage can be exceeded. Ponceau, particularly, possesses low solubility, and 2 to 3 per cent. is the danger mark.

Meat Trades

This trade is mainly in the hands of the spice merchant, who supplies the pork butcher with his spices, rusks, colour, and condiments. The colours previously mentioned as being fast to sulphur dioxide are the only ones that are of any use. Ponceau is the best red for sausage meat, and a variety of shades can be obtained by admixture with Tartrazine. The sausage manufacturer was in the habit, when he had a whole range of colours at his disposal, of using one colour for small sausages, which cooked out and did not colour the meat juice when the sausage was fried, and another colour for luncheon and polony sausage, which retained its shade in the boiling process. This was largely a figment of his imagination, the reason being that in the case of the small sausage the colour escaped on the bursting of the skin and was destroyed in the heat of the frying-pan, whereas, in the case of the luncheon sausage it was retained owing to the different method of cooking, namely, boiling which did not burst the skin. For the colouring of polony skins, Benzo Purpurine is generally used owing to its non-penetrating qualities, but this colour is, as previously mentioned, very susceptible to acid, and must not be brought into contact with the preservative, which will completely destroy it. The most suitable colour for rusks is, undoubtedly, Rhodamine, which should be incorporated with the dough before baking the rusks, and thus a much more satisfactory and uniform result is obtained than by spraying after the rusk is cooked. Ponceau is also used for this purpose, but it has not, of course, the same brilliance or tinctorial power.

Blackpuddings.—The use of a Water Nigrosine for colouring blackpuddings is much superior to the old method of boiling with soda, as the contents do not become tainted in the event of the skins bursting.

Brawn.—Bismarck Brown and Ponceau are the two most used colours here, but care must be taken to see that an excessive quantity is not used, or the jelly will show a bronzing. The bleeding into the fat, which often occurs, is due to the colours which are used being partially fat soluble, and tests should be made to ascertain this before use.

Margarine

The use of oil soluble colours in margarine has entirely replaced Annatto for reasons of strength and consistency. The colours used must be fast to fatty acid and light, and any shortcomings in fastness will be detected by the development of a pinkish shade. Alternative methods are adopted of either making up a concentrated solution of the required amount of dyestuff in cotton seed or similar oil, or mixing the colour straight into the bulk before emulsification, the small amount of colour used and the churning process effecting satisfactory solution. The colours offered for margarine are of low solubility, 2 to 3 per cent. being the maximum, and care must be taken to see that settling out does not occur on standing.

Fish

The colouring of fish is a simple matter, the colour being added to the brine and the fish immersed. The only difficulty that arises is through the backs of the kippers showing a colour deposit, which is usually due to the poor solubility of the colours employed.

(To be continued.)

French Importation Decree

THE French *Journal Officiel* for January 26 contains a Presidential Decree, dated January 17, and applicable three months after promulgation, which lays down regulations for the importation into France of various products of animal origin—viz., fresh, preserved and frozen mutton, pork, beef, and other meat (Tariff No. 16); boned and rolled hams, cooked hams, and salted meat (Tariff No. 17); pork butchers' produce (Tariff No. 17 *bis*); ox cheek, sliced, cooked, or pickled in barrels or jars (Tariff No. 17 *ter*); meat preserved in tins (Tariff No. 19); fresh, prepared, dried, or salted guts (Tariff No. 20 *bis*); and tallow, lard, and other animal fats for alimentary purposes (Tariff No. 30).

These products may be imported into France only if accompanied by a certificate issued by the veterinary service of the exporting country attesting that the goods are made wholly from healthy animals free from disease at the time of slaughter; that they contain no antiseptics, and that they have been prepared and despatched under hygienic conditions. These products must be subjected to sanitary inspection on arrival, except in the case of meat preserves (except pork butchers' produce), prepared by the Chavallier-Appert method or any similar process, and dried guts.

The veterinary certificate referred to above must give full particulars of the goods, and the name of the shipper and consignee, and the marks on the packings. The certificate (a copy of the form of which will be issued by the Minister of Agriculture) must be made out in the language of the country of origin of the goods and in French. All consignments not accompanied by a certificate will be returned, but importers will be allowed to declare the goods for warehousing with a view to their re-exportation.

Tallow, fat, and lard will be regarded as "for alimentary purposes" if they can be used for such purposes directly or after suitable treatment. If such goods are not intended for alimentary purposes they must be denatured.

Factors Influencing the Baking Properties of Flour

By T. H. FAIRBROTHER, M.Sc., F.I.C.,
Chief Chemist, McDougalls, Ltd., Millwall Docks, E. 14.

This series of articles discusses the various factors that influence the baking properties of flour. From the baker's point of view, this discussion involves the very fundamentals of his work. A baker may make a bad loaf from a good flour, but he cannot make a good loaf from bad flour. The quality of his loaf is dependent on more than correct oven control and his skill in the matter of punching and handling, for the quality and composition of the flour he uses are of profound importance.

PART I

The Influence of the Strength of Various Flours on Loaf Volume. The Loaves in the Centre were made from the Flour of No. 1 Manitoba, and when compared with the Loaves from English Wheat Flour, show up much bigger in Volume and of better Shape and Texture.

(From a Photograph by Dr. E. A. Fisher, Director of the Flour Millers' Research Laboratories, St. Albans.)

THE ART of flour milling is as old as civilisation, and each period in the development of knowledge and the appreciation of the comforts of life, has witnessed some progress in the art. In Ancient Egypt, Osiris—the Corn God—was the most sacred object of worship, and, after harvest, many were the sacrifices of comely, ruddy youths, to persuade the god to return again with plenty in the following year. Primitive man may have had a very simple means of utilising his cereals as food, and probably consumed them as a paste composed of ground grain and water before he realised the improvement to be gained by the use of fire, but long before history gives us details the craft of baking had become established, and in very early times even, it was vested with considerable importance. In those early times bakers were far from being regarded meanly; in fact, they were very important members of the community, for in Chapter Nine of the First Book of Chronicles we find, that whilst certain unspecified Levites were put in charge of stores such as wine, oil, spices, and even gold, the baker was considered important enough to be mentioned by name, and we learn that "Mattithiah, one of the Levites who was the first-born of Shallum the Korahite had the set office over the things that were baked in pans, and some of their brethren of the Kohathites were over the shew bread to prepare it every Sabbath."

"What is Bread?"

If anyone were asked to-day the simple question "What is bread?" he would have to pause and think before he could find an adequate answer. In bread

is concentrated the sunshine of two hemispheres, the mineral constituents of many soils, the multitudinous products of the activities of living cells—all utilised and made palatable by the skill of craftsmen in the light of centuries of experience. For centuries, cereal cultivation and bread baking were carried out on purely empirical lines. Wheat was grown and harvested. It was garnered and threshed, and later ground between the stones, and finally made into bread. The processes involved were all carried out mechanically, and very little was known of the actual factors which influenced the baking of flour into bread, and it is only in comparatively recent times that science has stepped in to attempt to elucidate some of these factors, and if possible, to improve the quality and yield of bread which can be made from a given amount of wheat.

Essentially bread is baked dough, composed of a mixture of flour and water with a little salt, which is "raised" by the development of carbon dioxide generated in the course of baking. This gas may be evolved by yeast fermentation or by other means, and to obtain a successful loaf great care must be taken in the kneading, pannification, fermentation, and baking processes, but as every baker knows, the quality, size, and texture of the loaf, the colour and appearance of the bread, may vary very considerably, from reasons quite apart from baking technique. The baker may use a standard method, correct in every detail, even to an electrically controlled oven working to within a degree of any desired temperature, but he knows that his loaf is dependent on more than this: the quality and composition of the flour he uses is of profound importance.

Flour Factors

There are many flour factors which enter into the production of bread, and possibly the best way to follow these will be from a discussion of the properties which are considered desirable in the finished loaf. From the baker's point of view the most important features of the loaf are: (1) Volume; (2) texture and "pile"; (3) colour; and whilst the individual skill of the baker in the matter of punching and handling, the character of his recipe, the relative amounts of yeast, salt, sugar, and shortening used, have much to do with the appearance and size of the loaf, the character of the flour has a predominating influence. A baker may make a bad loaf from good flour, but he cannot make a good loaf from bad flour. Flour consists mainly of starch, fat, sugar, and proteins, and the amount and character of the last named have a very big influence on the baking properties of the flour.

The importance of the protein content has been realised for a long time, and as long ago as 1745 Beccari was able to demonstrate that wheat flour could be separated into two parts (1) vegetable, and (2) animal, and he devised a method for washing out gluten, which persists even to to-day. Since the time of Beccari, many chemists have focussed their attention on the protein content of flour, and soon discovered that they were not dealing with a single, simple substance, but with a very complex mixture. In 1805 Einhoff found that protein could be extracted from flour by dilute alcohol, and he considered that the whole of the gluten was extracted, but in 1820 Taddei found that part only of the gluten was extracted by alcohol, and this part was called "gliadin." Liebig, in 1840, called the alcohol soluble fraction "plant gelatin" and the insoluble fraction "plant fibrin," but now the two fractions are generally known as gliadin (alcohol soluble) and glutenin (alcohol insoluble). More recent work has demonstrated that in flour there are several proteins including gliadin, glutenin, leucosin, a globulin, and certain proteoses. The importance of the protein content in bread baking is readily seen when it is realised that bread is somewhat in the nature of a balloon, or receptacle for holding gas, and the proteins must be good enough and plentiful enough to hold the gas which is produced during fermentation. It is the elasticity of the protein (together with an adequate supply of gas) which determines the volume of the loaf. It is also obvious that a plentiful supply of gas is necessary, and this is nearly always supplied by the action of yeast, and hence sugar is essential because it is used up by the yeast, which would not be able to work to its fullest extent unless there were sufficient sugars present and enough diastasic activity to produce sugars, to act as yeast foods. The main factors which have to be considered in relation to the baking properties of flour are:

1. The factors which influence the "strength" of flour.
2. The production of sugars by diastasic activity.
3. The effect of size of flour particle.
4. The colour of the flour and bread, with a consideration of the use of improvers and bleaching agents.

These will be dealt with in subsequent parts.

(To be continued.)

Books Received

Foods: Their Composition and Analysis. A. W. Blyth and M. W. Blyth. Seventh Edition. Revised and partly rewritten by H. E. Cox. Pp. 619. London: Charles Griffin and Co., Ltd. 1927. 38s.

Hermes, or The Future of Chemistry. T. W. Jones. Pp. 88. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1928. 2s. 6d.

A Guide to the Literature of Chemistry. E. G. Crane and A. M. Patterson. Pp. 438. London: Chapman and Hall, Ltd. 1927. 25s.

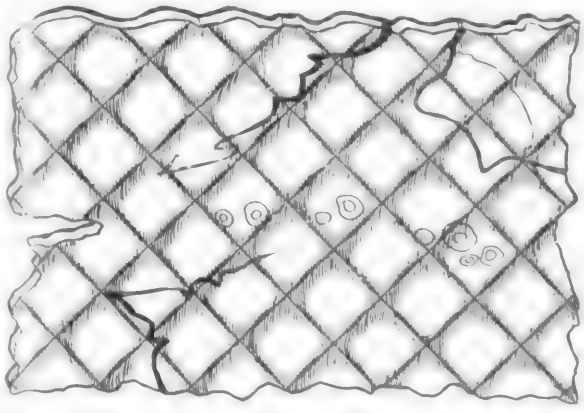
Food and Health. Mrs. A. Barbara Callow. Pp. 96. London: Oxford University Press, Humphrey Milford. 1928. 2s. 6d.

FOOD MANUFACTURE is sent to any address in the World for 10s. per annum. Send your subscription now to LEONARD HILL, LTD., 173, Fleet Street, London, E.C. 4.

Gelatine

By KATHLEEN PEARSON, S.R.N.,
Matron, Children's Sunlight Home, Stillorgan, Ireland,
AND
PAUL I. SMITH,
First-class Diploma in Leather Manufacture, Leathersellers' Technical College, London.

PART II.—PROPERTIES AND GRADES



A Sheet of Inferior Gelatine showing Cracks and Air Bubbles.

GELATINE MAY be regarded as the purest form of glue; a material which has been prepared under conditions of such rigid sanitary specifications that it may properly be classed as medicinal or edible. The chemist, however, considers the above definition a mere generalisation, and prefers something more concrete. Thus gelatine may be said to be the first hydrolytic product of collagen, while glue can be regarded as the result of further hydrolysis.

Properties

Gelatine occurs commercially as a colourless and transparent sheet, of horny toughness, and having a specific gravity of about 1·3, the average moisture content being approximately 10·8 per cent. It is of interest to note that Miss D. J. Lloyd has obtained a "chemically pure" gelatine, which is milk-white, and has an ash content of 0·1 per cent.

Gelatine possesses no definite melting-point, but begins to soften with decomposition at about 140° C. It is insoluble in cold water, alcohol, ether, chloroform, etc., but swells to a transparent jelly. Tannic acid precipitates gelatine from solution in the form of tannic gelatine, picric acid as gelatine picrate when excess of the former is used.

The swelling property of gelatine is, perhaps, its best defined and most characteristic property; it is especially noticed in weak alkaline and acid solutions. A good gelatine will take up from 5 to 10 times its weight of cold water when soaked, sufficient to enable it to dissolve on warming to 30° C. It will at once be noted that the gelatine swells, but does not dissolve; this is due to interesting forces and counter forces.

Thus slight alterations in the conditions of stability produce great changes in the extent of swelling. Increase in temperature will result in the diminution of the cohesive forces of the gelatine, until they become less than its attraction for the water and the jelly loses its structure and dissolves.

The melting-point of a 10 per cent. best hard gelatine is about 38° C., but for the usual commercial qualities it is between 25° C. and 30° C. The melting-point forms a useful criterion as to the purity of the sample; a low melting-point indicates presence of soluble gelatoses and other hydrolytic products due to bacterial contamination or over hydrolysis.

Other important properties of gelatine are its emulsifying and protective abilities. The theory of protectiveness is too long and complicated to attempt to deal with in this article, but it is sufficient to define it as a peculiar property possessed by certain colloids (emulsoids) of preventing an electrolyte (*i.e.*, salt or acid) from precipitating another colloid (suspensoid).

According to Zsigmondy the following gold numbers are attributed to the proteins. (It should be noted that a small number indicates a good quality gelatine endowed with marked protective properties.)

Gelatine	0·005– 0·1
Isinglass	0·01 – 0·02
Fresh Egg White	0·08 – 0·15
Dextrin	10 –20
Potato Starch	25 –

Market Grades

Manufacturers of high-class gelatines have very curious methods of evaluation. They sometimes employ numbers and symbols, which convey little if anything to the buyer. An explanation of existing nomenclature would require many pages and even then be unsatisfactory. For the present purpose, however, it is sufficient to state that a "Grade I." and "A" quality, "Gold Label Gelatine" or best "Leaf Gelatine" may be considered eminently suitable for medicinal and general food purposes. Only the most reputable firms should be dealt with—that is, to any appreciable extent.

Best French gelatine enjoys a great popularity among professional buyers in this country, and there is no doubt that this variety is looked upon with favour by ordinary householders.

Edible gelatine should contain only the merest traces of metallic impurities and sulphites. R. M. Mehurn (*Ind. Eng. Chem.*, 1923, 15, 942, 3) found that the purest commercial gelatine, containing only 10 per cent. water, yielded on the average approximately 1·5 per cent. ash. Of the heavy metals iron occurs in the ash to the extent of 1·25 per cent., copper varies up to a minimum of 0·17 per cent. An average ash may be said to contain CaO 53·46 per cent., MgO trace, FeO_3 1·22 per cent., P_2O_5 5·4 per cent., SO_3 36·36 per cent., SiO_2 3·36 per cent.

The above figures may be taken as representative "of good qualities of gelatine (edible)." Besides the metallic impurities mentioned, gelatine is "liable" to contain very small, almost infinitesimal, amounts of arsenic.

Sulphites are most objectionable in edible and photographic gelatines. They may be accounted for by the fact that sulphurous acid is sometimes used by manufacturers to delime the raw material. The sulphurous acid is generally made on the spot by passing sulphur dioxide gas through the water containing the raw material to be treated. After this the pieces of skin, ossein, etc., are thoroughly washed in order to free from the presence of sulphites and sulphurous acid. If, however, this washing is not carried far enough, then, of course, these sulphur containing impurities remain in the skin as impurities. E. Gudeman [*J. Ind. Eng. Chem.*, I (1909), 81] gives the following results of three analyses of gelatines by his own method (direct titration):

Home-made gelatine	...	...	...	0·0000	per cent.	sulphur dioxide
French	...	...	...	0·0260	,,	,, ,,
American	..	...	...	0·0120	,,	,, ,,

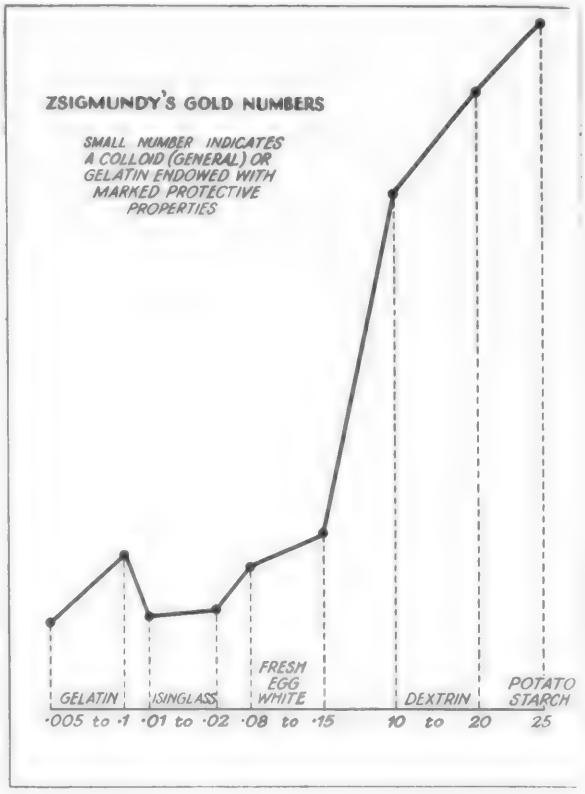
Very small quantities of sulphites or sulphur dioxide, less than ·02 per cent., have no deleterious action on foodstuffs, etc.

Requirements

To sum up, it may be stated that a "good edible gelatine" should have a low ash content, varying from ·5 per cent. to 2·5 per cent. (gelatine containing 10 per cent. moisture), and contain less than ·03-·02 per cent. sulphites. Other factors of lesser importance are moisture content, which should be from 15-20 per cent., and peptones or hydrolytic products due to bacterial contamination. Bogue gives the following amounts of bacteria in five representative samples:

I.	113,000,000	bacteria	per	grain	(inferior	quality)
II.	14,000,000	,,	,,	,,	,,	,,
III.	35	,,	,,	,,	good	,,
IV.	4,200	,,	,,	,,	fair	,,
V.	85,000	,,	,,	,,	,,	,,

It will be at once realised that III. is a "good edible gelatine," others being unsuitable for inclusion in foodstuffs.



Simple Inspection

A considerable amount of knowledge can be obtained by a close inspection of the gelatine; to the initiated the colour, odour, brittleness, presence of cracks and air-bubbles in any sample will be sure indication as to its quality.

A good gelatine will be of firm solid nature; it will be free from cracks and of a clear, transparent appearance, unless, of course, it has been rendered opaque (generally done on the continent for certain official varieties).

The smell of a hot solution of gelatine will sometimes indicate the source—*i.e.*, ossein, hide, skin, or fish. If the gelatine is perfectly pure it will be odourless. Opaque gelatine (unless specified to be so) should always be suspected for end products of hydrolysis—*i.e.*, peptones likely to be present, also putrefactive bacteria.

Although simple inspection is a good criterion of the quality of the gelatine, this is not the only test which the manufacture employs; there are others, both chemical and physical, the most important of which will now be mentioned.

Mineral Ash

The mineral ash should always be determined first, as the amount obtained will give at once a good idea as to the purity of the gelatine.

The general method of estimation is as follows:

A convenient amount of the sample is weighed out

and incinerated in a platinum or silica crucible. Ash should not exceed 2·5 per cent. supposing the gelatine "to contain 10 per cent. moisture."

Sulphur Dioxide

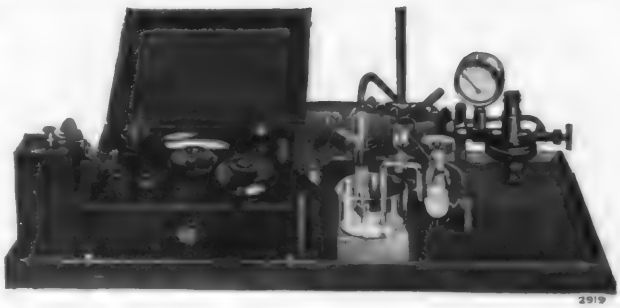
Sulphur dioxide is generally determined in gelatine. The usual method is to distil about 10 grams of the gelatine dissolved in 500 c.c. water, to which has been added 5 c.c. of a 20 per cent. solution of glacial phosphoric acid. The distillation is carried out in a current of carbon dioxide, and the sulphur dioxide distilled into a known excess of N/20 iodine. After 200 c.c. have come over, the distillate is titrated with N/20 thiosulphate solution.

1 c.c. N/20 iodine solution is equivalent to 0·0016 grm. SO_2.

Total Acidity and Alkalinity

This is an important estimation since free alkali or acid is most objectionable in gelatine (coagulating milk, etc., and imparting a sharp taste to the foodstuff). The acid is most probably sulphurous or sulphuric, and the alkali caustic soda or sodium carbonate.

Five grams of the sample are weighed into 500 c.c. Erlenmeyer flask and covered with cold water and allowed to soak until quite soft and swollen. The mass is then warmed until a solution is formed. Previously boiled distilled water is then added to bring the volume up to 300 c.c.. Five drops of phenolphthalein are then added (0·1 per cent.), and colour of solution observed. If the indicator does not change colour the solution may be regarded as acid, if pink coloration takes place the solution is alkaline. Solution in those cases should be titrated with N/10 caustic soda or N/10 hydrochloric acid respectively. (It is advisable in the case of acid solution to titrate first with alkali then back again with acid and *vice versa*.)



Electrometric Apparatus for Determining pH.
(By courtesy of Cambridge Instrument Co., Ltd.)

$$\text{c.c. N/10 HCE used} \times \frac{100}{5} = \text{(Alkalinity in terms of N/10 NaOH per 100 grms.)}$$

$$\text{c.c. N/10 NaOH used} \times \frac{100}{5} = \text{(Acidity in terms of N/10 HCE per 100 grms.)}$$

Other Tests

The tests mentioned are simple and purely "indicative" tests. It is always advisable to have the gelatine analysed periodically by the works' chemist or public analyst; in this case the following tests should be stressed:

Physical—Jelly consistency. Viscosity. Melting-point. Gold number.

Chemical—Ash. Determination, qualitative and quantitative, of inorganic impurities, especially copper, zinc, arsenic, and lead. Estimation of sulphur dioxide. Organic analysis. Fat estimation. Acidity, using the electrometric apparatus and expressing acidity in terms of pH.

(To be continued.)

Dried Fruits Control Board.

Mr. James Somerville, jr., states that there is now less objection (by members of the dried fruit trade) to the method of Government control on the marketing of Australian dried fruits in London than there was when this plan was inaugurated. Apparently, it has been found to work out better in practice than the trade anticipated. A limited number of ports and wharves have been designated as receiving points for Australian dried fruit. When a shipment of this fruit is received at one of these designated wharves, a sample is at once sent to the official appraiser in the London agency of the Dried Fruit Control Board. This official appraiser examines the quality of the sample, and, in the light of his recommendations, a minimum price is determined, which is given to those brokers or merchants to whom the shipment may have been consigned. These brokers or merchants then attempt to dispose of the shipment at the price named or at a better price if possible. If it is found impossible by any broker or merchant to dispose of his dried fruit at the price set, he may then appeal to the London agency of the Dried Fruit Control Board for a reconsideration. The Australian Board makes a point of trying to work as closely with the trade in these matters as possible, and this may account for the apparently successful working of a control plan, which technically is not greatly different from similar plans that have come to grief in the past through determined trade opposition.

The Board exercises no direct control as regards the choice of brokers and merchants in London to whom dried fruit may be consigned, except in so far as the Control Board in Australia has a right to refuse export licences to Australian shippers.

(Continued from page 296.)

is not excessive. In processing canned foods any sulphite that may be present appears to be reduced to hydrogen sulphide, and this goes into combination with tin and forms a tarnish on the inside of the can similar to that found with certain vegetables. With such vegetables this discoloration on the interior surface of the can is normal, and consumers do not object to it. With fruit, however, the same amount of discoloration, or even discoloration to a lesser extent, is unusual and causes complaints.

Captivating Continental Containers

FROM THE SWISS WINTER RESORTS.

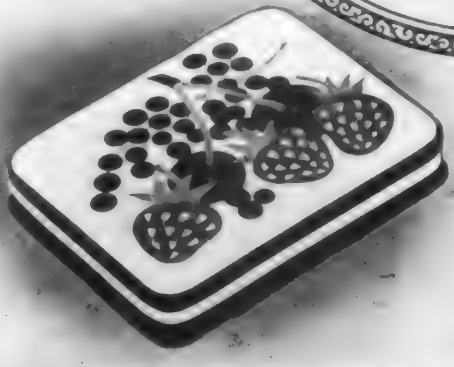
Zwiebach Biscuits served with afternoon tea in airtight glassine wrappers.

An exclusive package in reds and black used by a pattiserie and confiserie.

A Peter's assortment showing variously-shaped pieces. The silver wrapping is particularly even and neat.

Fruit jellies in a striking box printed in flat tints.

The cover for Peter's box shown in centre. The design in shades of brown is very attractive.



Captivating Continental Containers

THERE WERE, of course, a great many other packages and a variety of miscellaneous goods in the window from which the packages shown on the opposite side were taken. Passing up and down the one main street of a popular Swiss winter sports resort, an attractive mass of colour more than once caught our roving eye. We may be unobservant, but no such pleasing window display of British confectionery seemed to have impressed itself as did the two separate shops making the display from which these examples were selected. A principle which does not seem to have received sufficient consideration by our own makers was here shown in practice—that of one colour design and the massing of them in the display window.

Chocolate Brown

The window of browns was, perhaps, the more attractive. It was not an overcrowded window, and very little decoration, apart from the stock, was used. The box itself measures 6½ ins. by 3¼ ins. by 1¾ ins., and, as the illustration shows, contains Peter's chocolate; the only lettering appearing on the box is "Bonbons Fins au Chocolat D. Peter." The conventional flower designs are in two shades of brown with gold edging, the stems and leaves in black, the leaves with gold edging, gold berries. The berries, the centre of the flowers, and the lettering, are enclosed. The whole is printed on a glossy white paper. The ribbon is of orange with black edging. The design is free and singularly attractive, and the single box has been favourably commented upon by members of FOOD MANUFACTURE staff. As a selling package it would doubtless hold its own if shown cheek by jowl with a variety of other boxes of different colour schemes in the sort of window usually found in this country. Under such circumstances it would probably fail in securing its share of sales owing to the small lettering, which is not nearly so legible as in the average British box. This is, perhaps, its only weakness. It does undoubtedly score heavily when used as a means of creating a colour scheme for window decoration. It is now difficult to recall the actual arrangement of the display. As already said, the goods were allowed reasonable space to allow the eye to see something. The general effect was pleasing to a high degree.

Red Hot

The box package was bought in a *pâtisserie*, where the window was dressed in such a way as to allow a view from outside of the tempting array of the day's *gâteaux* displayed under the glass of the counter inside the shop, where, as is usual in Continental tea-shops, the customers taking tea look round, arm themselves with a plate, and help themselves to the delicacies they fancy, always, of course, selecting the largest of the species or that which seems to carry the most cream.

It was found in this case that this package was special to the shop, and was used in a number of sizes to enclose all the purchases of the customers in the way of confectionery.

It is in red, orange, black, and gold on a white board, not glazed; the lettering and floral medallion are embossed, tied with gilt cord. The floor of the window carried mainly a selection of chocolates displayed on trays, ostensibly made in the shop. Above were two hanging glass shelves; on the upper shelf stood a very large presentation box of semicircular shape, flanked by two smaller triangular boxes. On the shelf below was a pyramid of the packets shown in our illustration, and suspended below the shelf were more packets in the form of an inverted pyramid. To each side of the lower shelf, which was just below eye-level, were arranged a very few crystal flowers, and the display completed with half pyramids of boxes complementary to the series, but for larger quantities.

In this window there were no other packages competing for attention, and therefore anything arranged with care would have achieved the same decorative effect so far as arrangement goes. It is very doubtful, however, if boxes carrying a great many colours and of the complicated design so usually found on British boxes would have caught the passer-by as did this charming display of subdued reds.

Flat Tints

The flat box carries fruit jellies. It formed part of a general assortment of confectionery, etc., in a glass showcase inside the shop, not apparently specially arranged. The very attractive design caught the eye, and, on removing the lid, the display of jade-green, orange, lake, sepia, purple, or white, moulded into the shape of the fruit they represented, was sufficient to make a sale. The price was 1 franc 80 centimes (Swiss). The box contained, perhaps, twenty pieces. The design is carried out in flat tints of sage-green, wine-red, orange, and a dark plum-red on white background; the flat colours make a design of great strength and of great arresting value. As the contents were closely covered by transparent cellophane material and nothing else, a display of the contents would greatly assist in making sales. Here again the colour scheme was attractive, the pear-shaped pieces being a golden yellow in the centre, surrounded by a half-circle of green, greengage flavours, the remainder—top, centre, and corners—being red.

There can be little doubt about the selling value of boxes like these. Apart from definitely attracting attention to the display, any box of outstanding merit in the way of simple yet strong design should do much to decide the choice of a hesitant or undecided purchaser. The writer would welcome any comments or queries on this particular angle of display.

Replacing Toast

The Zwiebach biscuits so familiar on the tables of some of the hotels at breakfast and tea do not rightly form part of the story. The little packages, with their crisp, brown, toast-like contents, simply ask to be eaten. It is quite probable that something similar would find a ready sale in England to replace the traditional stodgy toast of the average hotel, and even, perhaps, some private houses.

Colloid Chemistry and Food Technology

By WILLIAM CLAYTON, D.Sc., F.I.C.,

Chief Chemist, Crosse and Blackwell, Ltd., London; Hon. Secretary, British Association Committee on Colloid Chemistry.

THE WHOLE field of Colloid Chemistry is reflected in the food industries. Proteins, emulsions, jellies, syneresis, adsorption, ageing of colloids, reversible and irreversible changes, protective action, etc., all play important rôles in specific foods. Valuable as is the training of a food chemist in organic chemistry, a sound knowledge of the chemistry and physics of colloids is essential to the solution of problems continually presented by such complex systems as foods.

Graham's colloids, instanced particularly by gelatin, are now but special cases in a much wider range of substances. Instead of colloids, we speak of the colloidal state, recognising that any substance may be obtained in the colloidal form. In place of a chemical definition there is now a physical one.

The properties of matter in bulk become radically modified when extensive subdivision occurs. Fine dispersion brings into play surface forces, so that new characteristics accompany the formation of drops, grains, bubbles, jellies, etc. Modern colloid chemistry is concerned with the properties of matter in a finely-dispersed state—*i.e.*, when an extensive interface area is presented.

The interface area is usually a liquid/gas boundary —*e.g.*, milk froth, or a liquid/liquid boundary—*e.g.*, an emulsion, like cream. The solid/liquid boundary is represented in the swelling of substances like gelatin in water giving rise to a jelly.

Broadly, the colloid problems presented by foods may be instanced by consideration of special food groups.

Milk and Milk Products

Milk is a complex colloid system containing fat in emulsion form, and proteins in colloidal solution. The colloid chemistry of milk centres round such problems as the foaming of milk when agitated, the separation of fat as cream, the inversion of cream (an emulsion of fat-in-water) to butter (an emulsion of water-in-fat) by churning, the thickening of milk and cream by homogenisation, the manufacture of artificial milk, ice-cream and cheese. The adsorption or boundary-concentration of proteins is fundamental in all these changes, and involves a study of the influence thereon of electrolytes, pH, and temperature. The curdling of milk by rennet is probably the most complex problem in dairy chemistry, and is essentially a matter for the colloid chemist.

Fatty Foods

Emulsion problems connected both with the making and breaking of emulsions are immediately reflected in the study of butter and margarine, mayonnaise and salad creams, medicinal emulsions, chocolate, etc. The refining of edible oils also has its colloidal aspects, as, for instance, the use of finely-dispersed earths for deodorising and decolourising.

Beverages

The study of froth or foam is a matter for colloid physics, dealing as it does with the adsorption of substances at a liquid/gas interface, due to the lowering of surface tension. Again, the influence of colloids on the solubilities of gases in water is of interest. Tea, coffee, cocoa, and beer furnish colloid problems, as also does the purification of water by alum flocculation.

The Baking Industry

Starch is a typical colloid, and the literature on its physical chemistry is voluminous. The phenomenon of the ageing of colloids has to be studied in the important matter of making bread. A wealth of information has been forthcoming from Ostwald's laboratory on the colloid chemistry of flour in relation to bread baking, whilst the very recent work on molecular orientation has been applied to the study of shortening agents.

Animal Foods

The proteins present in meat, fish, eggs, etc., introduce colloid problems of great complexity. The freezing of colloidal systems is of fundamental importance in the cold-storage of meat and eggs. Syneresis of jellies (the exudation of liquids) demands study in relation to thawing of cold-stored foods. In this connection very important research is in progress at Cambridge, the investigations being essentially academic in basis.

The salting of meat and fish induces colloidal changes still open to exploration.

Sweet Foods

Sugar purification is a problem in colloidal chemistry, particularly in the matter of defecation. But it is with jams and fruit jellies that the colloid chemist has particularly to deal. Here the system, pectin-acid-sugar, is the basic study, and in spite of extensive research, our knowledge is still incomplete. The typical colloid, gelatin, is used in the manufacture of table jellies.

Finally, the process of digestion and food absorption is essentially colloidal, and introduces the study of enzymes which simply must be studied from the physico-chemical standpoint. Even the recent discovery of vitamins has not escaped the colloid chemist, von Hahn having published a series of papers attempting to show a relation between the vitamin content of foods and certain colloid characteristics. To the food chemist trained in modern physical chemistry many avenues are opened for investigations, and his work gains in interest and value the more he learns of the progress of current research on colloids.

Food Manufacture from the Consumer's Point of View

By A. BARBARA CALLOW, M.A., M.Sc., M.S.,
Author of "Food and Health"

With the advance of popular science, a change is taking place in the point of view of the consumer. The housewife is beginning to understand food values, and wants to know what she is buying. Enterprising manufacturers will anticipate the new movement and label their food products in an intelligent and comprehensive manner.

THE GLORIES of the Victorian Age are no longer with us, and the old-fashioned housewife who made nearly everything at home has given place to the busy modern woman who buys a great many things ready-made. Except in Scotland and the North of England, home-made cakes are rapidly becoming a luxury, and home-made bread is almost unknown. An increasing number of housewives buy ready-made foods, such as jam, marmalade, chutney, pickle, sauces, soups, etc. This modern tendency is, at any rate, very good for the food manufacturer, and it probably benefits the country as a whole by saving the nation's fuel. Whether it is a good thing from the nutritional point of view of course depends on the relative food values of the home-made and the bought product. In some cases it must be admitted that the ready-made article tastes as good as or even better than the home-made. Certainly every reliable new manufactured food that is put on the market will be welcomed by the great mass of women who do outside work as well as housekeeping.

What the Housewife Wants to Know

Although the modern woman has little time to spare for the actual preparation of meals, she has considerably more idea of relative food values than her grandmother had. Nowadays, newspapers, magazines, and domestic science classes are all helping to spread the results of researches on nutrition, and the intelligent housewife of to-day realises that the science of diet is a study of the first importance. She is gradually realising that we must have a proper balance of fat, carbohydrate, and protein in our diet, and an adequate ration of water, mineral salts, and vitamins, and, further, that diets should have a suitable calorific value. In her endeavour to provide proper food for her family, she is faced with the difficulty that very often she knows nothing about the composition of manufactured foods. Frequently the names are not very helpful, and there is nothing to indicate the ingredients used, place of origin, date of preparation, methods of handling, etc. In a great many cases the only information given is "Made from the finest ingredients"! We want to know what the ingredients were. When we buy bread, we want to know how much water there is in it; in the case of brown bread, we want to know whether it is whole wheat, or how much germ and husk has been added. When we buy packet soups, prepared custard powders, cake powders, etc., we want to know what ingredients were used, and in what proportions. Similarly, with canned foods, we want to know the weight of the food inside, together with other indications of the quality, etc. In a recent number of the *Canner*, it was stated that the American housewife is by no means satisfied with the labelling of canned goods. She finds the attractive picture on the label of no use at all. "What she really wants to know is whether the twenty-cent can of beans which she finds on the grocer's shelf weighs two pounds eight ounces or only one pound three ounces. She wants to know whether the can contains one cupful of liquid or two and one-third cupfuls of liquid, whether the solid material weighs ten ounces or six ounces. If it is peaches she is buying she wants to know the grade, the number of the can indicating the size, the proportion of syrup to solid fruit, the approximate number of pieces of fruit it contains and their size, and the thickness of the syrup, whether heavy, light, or medium." It is doubtful as to whether the English housewife demands quite so much information, but she will shortly demand more than is at present provided. Quite often nowadays no information is given except the name, and that sometimes seems to be either ambiguous or actually misleading. Many potted goods are inadequately marked. When we buy what is called "Potted chicken and ham," we want to know how much chicken there is in it, and how much ham; is it a case of "fifty-fifty"?

Fifty-Fifty

In the old pioneering days in North America, it was often the custom for trains to have a midday halt, during which the passengers got out to have a meal at the local "eat-house." One such "eat-house" was famous for its rabbit pie. The owner was once asked how he managed to supply good rabbit pie so cheaply in a part of the country where rabbits were not very plentiful. The owner explained that he put a little horse into the pie as well as rabbit. "How much horse?" asked his friend. "Fifty-fifty," was the reply; "one horse, one rabbit."

How the Manufacturer can Help the Consumer

The modern tendency to buy food ready prepared is undoubtedly well established by now, and few modern housewives would welcome a return to the old arrangement of preparing most things at home. Even if the modern woman wishes to have home-prepared foods, it is often impossible for her to do so, for she has no time herself, and cannot get adequate domestic help at a reasonable price. Now, if we are to buy more and more manufactured foods, it is clear that we shall insist on having more information about their origin and make-up. The idea of giving descriptions of the contents on food

packages is not, of course, a new one. Already, for example, the manufacturers of certain baby foods give on their labels the chemical composition of the food, sometimes with further valuable notes. But this principle should be much more widely adopted. The manufacturer who prepares a wholesome commodity under modern hygienic conditions has nothing to lose by telling the truth about the product that he puts on the market. On the other hand, any manufacturer who knows that he would lose custom by letting the public know how his products are prepared is only a "confidence-trick" man, and does not deserve to succeed. When made-up foods are properly labelled, the best preparations will soon be recognised, and inferior products will be gradually ousted from the market.

Ideals and Advertising

Advertisements are often magnificent from the artistic point of view, but are they as truthful as we should like them to be? Do they give us an accurate idea of the commodity? Alas, not often. Yet the manufacturer who publishes full details of the ingredients, methods of preparation, etc., will not only help the consumer but he will also help himself. By taking his customers into his confidence he will soon gain their loyalty and support. Already many progressive manufacturers realise that it is a good thing to encourage the public to visit their factories, and see the conditions under which the foodstuffs are prepared; but not many manufacturers yet see the value of descriptive labelling, advertising of recipes, methods, etc. This method of procedure is open to the objection, it will be said, that these manufacturers may have to give away their cherished "trade secrets." But how much will they actually lose by this? Practically no commodity is unique, which means to say, that in nearly every case there is at least one other firm which has "trade secrets" of a similar nature. The Americans have already discovered the absurdity of keeping their processes secret, and they are willing to discuss their methods even with their rivals. This seemingly altruistic behaviour is in reality sound business, because exchange of ideas between manufacturers inevitably leads to mutual benefit. Manufacturers who adopt this enlightened policy of free discussion will obviously have no hesitation in labelling their goods as they should be labelled. The housewife will then be able to buy standard preparations of known constitution, and there is no doubt that she will prefer to have them even if they cost a little more than similar products of doubtful origin; for what the housewife wants to know about manufactured foods is the truth, the whole truth, and nothing but the truth.

Scientific Progress in Dough-Making Machinery

TWENTY-FIVE YEARS ago most of the dough made in this country was mixed by hand; hard laborious work it was, with the possibility of the human element not doing its work properly, and not by any means a hygienic process.

Only the large firms had dough machines, which were of an expensive and cumbersome type, beyond the means of the average baker, and far too large to suit the average bakehouse.

At this period the rotary mixer was first introduced, and became very popular; it eliminated the hardest work, and considerably reduced the time taken in dough making; it also introduced the first step in hygiene in the small bakery.

The earliest rotaries were made for hand power, for at this time the electric motor and internal combustion engines had not reached a commercial stage, and were expensive to buy and to maintain.

A long-felt want was met by the rotary mixer, and it established itself for a time as the standard of dough mixers.

The mixing process consisted of tumbling the flour and liquor, by gravity, through a grid or over bars as the machine rotated; in this way they were amalgamated, then turned out into a trough to prove, not always thoroughly mixed, but an advance upon badly made hand doughs.

About fifteen years ago science began to take an interest in dough-making machinery, and the earliest forms of the open type kneader were introduced. One of the first was the "Human" kneader, so called, because, for the first time in mechanical dough making, the human action was made in machine form.

Many advantages were claimed over the rotary type machine, chief among them being, thorough shaking in of the ingredients, and the stretching, folding, and aerating action set up by the mixing arm and revolving pan, under the observation and control of the operator. This action of kneading produced a more rapid development, and equal distribution of gluten and yeast, and assured a thorough amalgamation of the ingredients, and by the stretching action a stiffer dough was produced; this had to be counteracted by greater amount of liquor, consequently a bigger yield was obtained, and a loaf of fine texture and good volume.

The process was cleaner, and being an open type machine under complete control the dough could be seen during the whole period of kneading.

When the dough was taken from the pan it left it as clean as before use, and quite odourless.

In the larger bakeries it was soon recognised that the "Human" kneader, with wheel-out pans, marked a big advance in hygienic dough making; one kneader with several pans could be used, and in this way the dough was not touched by hand in the whole kneading process.

Scientific progress then became rapid, and from dough untouched by hand, through the medium of the open type kneader, scaling, moulding, and proving then became automatic, and by the introduction of the travelling oven and wrapping machines we have to-day large quantities of bread all over the country being produced untouched by hand from commencement to finish.

The U.Y.C. Outlook

Canning Research

The following is extracted from Bulletin No. 103-A, "Scientific Research Applied to the Canning Industry," which has recently been issued by the National Canners Association, Washington, D.C., and is continued from last month's issue. As we have pointed out, this pamphlet gives a survey of the scientific work carried out in the Association's laboratories.

PART II.—TECHNOLOGICAL OPERATIONS

THE RESEARCH laboratories are constantly studying the technological operations of canning with a view to preventing spoilage and improving the quality of the finished product. The occasion for this work sometimes originates in the laboratories, and sometimes the work is done in response to inquiries from individual members who have experienced an unusual amount of spoilage or something objectionable in the appearance or quality of their product.

Foreign Metals

Great Britain, some months ago, made objection to certain canned food products because of the presence in them of zinc in an amount slightly exceeding that permitted by the British regulations. An investigation of the source of the zinc showed that galvanised containers had been used for temporary storage in the process of manufacture. Steps were immediately taken to correct this condition.

Discoloration has occurred in several canned products because of the presence of a trace of copper. The amount of copper present was insufficient to be objectionable from the standpoint of health, but it produced discoloration which detracted from the appearance of the product. In the canning of corn, copper or brass cookers are used which are coated with tin. Formerly they were not always coated, but this condition has been corrected. The filling machines have brass valves for measuring the corn into the cans. These valves do not give up copper to the corn when they are in regular use, but if for any reason the machine is not used for several days, a very slight oxidation occurs on the surface so that the first corn passing through takes up a trace of copper from the valves. This copper combines with hydrogen sulphide set free in processing the corn and forms black sulphide of copper and thus darkens the entire contents of the can.

The laboratories have shown that when the amount of copper greatly exceeds one part per million of the corn (1/10,000th of 1 per cent.) the corn is sufficiently darkened to lower its commercial value. The presence of as much as 3/10,000ths of 1 per cent. of copper makes the product almost black. The results of this work were published in 1915, and steps were immediately taken to eliminate exposed copper as far as possible. To safeguard against the trace of copper taken up from machines that have been out of use for several days, special precautions for cleansing the machines are taken at such times.

Details of Processing

The work done by the laboratories in establishing appropriate processes is discussed later. Difficulty is sometimes encountered in so controlling the process that cans in all portions of the retort shall receive heat uniformly, and shall receive just the heat treatment that is desired. The retorts must be properly equipped with pipes to admit steam and water, and to drain the water out when desired. The size of these pipes is important, and may vary in individual plants according to the steam pressure carried and the peculiar manipulation desired for the products packed. The retort thermometers are located in a box protruding from the side of the retort. When the processing is done in dry steam a vent is left open in the side of this box farthest from the retort in order that steam may blow across the thermometer bulb and thus insure good distribution of heat.

Sometimes, because of special conditions, it is desired to have the cans covered with water in the retort. In such cases, it is, of course, impracticable to leave a vent open in the thermometer box and this box, therefore, is not heated quite as high as the body of the retort, and the temperature indicated by the retort thermometer may be several degrees lower than the retort temperature. This condition has been pointed out, and must be considered in processing.

When cans larger than No. 2 size are processed under pressure at temperatures of 240° F. or higher, the blowing off of the steam immediately after processing, which subjects the cans immediately to atmospheric pressure, causes buckling in the ends, and this in turn causes leaks in the seams. To safeguard against this the cans must be cooled under pressure while in the retort. It will be seen that because of such variations in conditions canners are likely to over-process some products and thus make their colour darker or disintegrate them more than is desired.

Cooling after Processing

In canning the majority of food it is customary to cool the cans in water after processing. With some products such cooling is not necessary, provided the cans after processing are stored in shallow piles or narrow tiers so that they will air-cool within a short time. If they are stacked in large masses before being properly cooled they, of course, retain their heat for a number of days, and this may lead to several forms of deterioration. With acid products the action of the contents on the tin plate is more severe because of the higher temperature, and springers or perforations may be produced. With many products some form of "stack burning" occurs. The continued heat disintegrates the contents so that they present the appearance of being over-cooked. The colour is also darkened to an objectionable degree.

With certain vegetables, such as corn and peas, the most resistant spores of thermophilic bacteria are not always destroyed in processing. These spores will not germinate at temperatures below 100° F. If a canned product is stored in a warehouse in large masses so that the cans remain for several days at temperatures materially in excess of 100° F., spoilage may occur. This whole subject has been studied by the research laboratories in the investigations described elsewhere, and detailed suggestions have been made regarding the matter.

Storage of Canned Foods

The influence of temperature on the formation of perforations and springers has been briefly discussed; likewise the influence of temperature on the growth of spores of thermophilic bacteria in some kinds of canned foods. These considerations must also be kept in mind in the storage of canned foods by both distributors and canners. They should be stored at as low a temperature as is practicable, and the storage-rooms should be dry, properly ventilated, and protected against sudden changes in temperature that might cause condensation of water on the cans.

Special Forms of Discoloration

It sometimes happens that individual canners encounter some form of discoloration that is unusual and is caused by some conditions peculiar to their operations. A few illustrations of such studies are cited.

The colouring matter in the outer coating of some varieties of beans forms a combination with iron which has a dark purple, almost black, colour. Special precautions for the canning of such products are sometimes necessary. One canner who packs a variety of string beans, the seeds of which are slightly coloured, found that in his canned products the seeds had taken on such a dark colour that they showed through the hull, presenting an undesirable appearance. Investigation revealed that he was giving a process that was unnecessarily long, and shortening it to the proper length eliminated the dark colour.

Beets are sometimes canned whole and sometimes after slicing. Discoloration has occurred at the centre of the sliced beets. This was found to be due to allowing them to stand too long after slicing before they were canned. Under these conditions an enzyme at the centre of the beet, which had not been destroyed in blanching, produced a marked darkening. This was eliminated by prompt canning after slicing.

Ketchup sometimes shows a black band in the neck of the bottle next to the cork. This has been found to be due to a leak in the closure sufficient to admit air but not large enough to admit bacteria and produce spoilage.

Canned okra sometimes shows a black discoloration on the cut ends of the pieces. This has been found to be due to the use of iron knives used for cutting the product.

Black spots of iron sulphide have occurred in salmon cans, and discoloured the salmon and the liquid. These were found to be associated with loose seams and paper gaskets.

Somewhat similar to these difficulties with regard to discoloration are the complaints that broken glass has been found in salmon, crab, and shrimp. Whenever investigated, however, the glass-like particles proved to be crystals of magnesium ammonium phosphate, a harmless substance occurring naturally in these products, but only forming visible crystals under certain conditions such as extremely slow cooling.

Materials Used in Canning

The laboratories have given considerable attention to a wide range of materials used in canning, both in connection with the machinery and in the preparation of the food itself. The work done with water, salt, and sugar illustrates the nature of these investigations.

Water.—There is a general impression that when hard water is used for canning it has a toughening effect on the product. This is not generally true. After studying a wide range of products the laboratories have reached the conclusion that this toughening effect occurs only with peas and shelled beans. In efforts to overcome it softeners have been used to soften the water used for blanching and in the preparation of the diluted brine added to the can. Such softened water, however, when used in both blanching and brine sometimes produces an undesirable flat taste. Many canners have now adopted the medium course of using softened water for blanching but hard water for brine.

Multiplication of by-product coke ovens in the United States during recent years has added a new problem to our water supply, and especially to the canning industry. The effluent of such plants contains phenol bodies which combine with the chlorine used by municipalities for treating water. The result is the formation of chlorophenols, which give the water an objectionable flavour that has caused a good deal of annoyance in some cities. Even when these chlorophenols are present to such a slight extent that the water is accepted by the cities and for general use in the homes, it sometimes imparts to canned foods an undesirable flavour. Very few canning plants have met with this difficulty, and it is hoped that it will not be encountered in the future. The laboratories investigated the condition in the canning plant which had the greatest amount of trouble, and were able to fix the responsibility on a particular set of coke ovens. Steps were immediately taken to correct the condition.

Salt.—The United States standards for salt permit the presence of calcium compounds to such an extent that salt barely complying with those standards imparts to brine manufactured with it all the objectionable characteristics of hard water. The laboratories have pointed out the degree of purity of salt desired for canning peas and string beans, and have suggested specifications that should be insisted on by canners. Salt manufacturers are in position to comply with these specifications.

Sugar.—The canning industry almost universally uses standard granulated sugar for all products to which sugar is added. Sometimes plantation refined sugar has been used, and in such cases care must be exercised that the amount of sulphite sulphur present

(*Continued on page* 289.)

Acid Calcium Phosphate

ONE OF the most striking features of the foodstuffs industry is the great care that is bestowed by most manufacturers on raw materials and processing operations in order to ensure a high degree of purity in their products. In the case of raw materials, the food manufacturer is largely in the hands of the suppliers, unless he has his own chemist to check analyses, or unless he is safeguarded by regulations enforcing compliance with some standard specification.

Acid calcium phosphate is a case in point. This material is used as an ingredient of self-raising flour, or of baking powder, and as a flour improver. In the case of self-raising flour or baking powder, phosphate powders merely act as an acid for the production of carbon dioxide from bicarbonate; as a flour improver, they are used to improve the quality of the dough, by an alteration of the pH. The colloidal behaviour of gluten and of dough is conditioned by the amount and nature of the electrolytes present, and, according to Bailey, salts which contribute trivalent ions such as PO_4 effect a measurable modification of the dough properties, and keep the gluten in a coherent condition.

So far, there has been no definite standard set up for the quality of acid calcium phosphate in the Food and Drugs Act, but acting on a report issued by Dr. Hamil in 1911, on "The Bleaching of Flour and the addition of so-called Improvers to Flour" (Cd. 5613), the Ministry of Health have issued certain recommendations which suggest that the amount of calcium sulphate should not exceed 10 per cent., and, of course, as regards arsenic and lead, it comes under the usual standards of the Food and Drugs Act.

The National Association of British and Irish Millers recommend 0·3 per cent. acid calcium phosphate for improving (Report of Departmental Committee of the Ministry of Health, 1927). In the case of self-raising flours, this amount is, of course, greater.

The manufacture of acid calcium phosphate has been very much improved in recent years, and now it is possible to buy it in a very high degree of purity, with less than 1 part per million of arsenic, less than 10 parts per million of lead, and less than 0·25 per cent. of calcium sulphate. Millers have become very stringent about the quality of the materials they use in flour, and, for obvious reasons, a material with 10 per cent., or even 1 per cent., of calcium sulphate would find no sale.

In the past, there has been a confusion between the acid calcium phosphate which is prepared by the hundreds of tons for manure, and the highly refined acid calcium phosphate which is used for flour; and, as a result, both the makers of the material and the users feel that the high purity of the product to be used for incorporation with flour should be recognised. Hence the English manufacturers, led by Messrs. Albright and Wilson and Messrs. Boake Roberts, are asking the Board of Trade to certify the material as a Fine Chemical under the regulations of the Safeguarding of Industries Act. Presumably because such a declaration would involve a 33⅓ per cent. duty on imported material, an opposition has been set up by certain American manufacturers and their factors in this country, and the anomalous position has resulted that certain American makers of a product sold entirely for foodstuffs declare that it is not of fine chemical quality.

Everyone interested in the manufacture of foodstuffs will disagree with this suggestion. Most emphatically, everything to be incorporated in foods should be of the highest degree of purity possible. The whole case hinges on a definition of a fine and a heavy chemical, and no one seems to be able to give a satisfactory definition of a fine chemical. The simplest and most helpful definition is to make purity a criterion and state that when very special methods of production have to be adopted, and intimate supervision by skilled chemists is required to produce a substance of a high degree of purity, then the product is a fine chemical. One regards oil of vitriol as a heavy chemical, but the highly refined sulphuric acid for analytical purposes as a fine chemical. The term "fine chemical" is obviously too narrow, and was introduced without sufficient investigation. A substance should be graded for purity according to the purpose for which it is to be used, and consequently we should have definite brands of substances for foodstuffs, for photographic purposes, for analytical purposes, and so on, each with definite standards set up—in the case of foodstuffs—by the Ministry of Health.

It is to be hoped that the confusion about the definition of fine and heavy chemicals will not be a herring across the trail, and leave the door open to the introduction of impure substances into foodstuffs. It is high time that the Ministry of Health issued a definite standard for all materials to be used in foodstuffs, and that the user should be safeguarded from the supply of inferior and impure materials by the makers.

Millers insist upon having a material of fine chemical quality, even if they have to pay more for it, and it is significant that they have sent Dr. Humphrey to give evidence in support of its being a fine chemical.

Trade News

AFTER HAVING fallen on rather evil days following the war, Crosse and Blackwell, Ltd., have apparently made a striking recovery under fresh leadership in the last three years. Following a succession of losses, three years ago the company broke even in its trading profits; in 1925 it made a profit of £100,000; in 1926 one of £148,000; while during the present year, according to the managing director, "the curve of profits" has continued to rise. Aside from the fact that the company has apparently been under more aggressive management, contributory factors to this improvement have been a concentration of its operations in fewer factories, and the installation of more and more modern equipment in these factories. The firm is now operating branch factories at Baltimore, Maryland, and Toronto, and it is said that other plants are contemplated.

* * *

The firm of Angus Watson and Co. (Australia), Ltd., with nominal capital of £100,000, was registered at Sydney during the month. This is a subsidiary of Angus Watson and Co., and a representative from the company will shortly visit Sydney to investigate the possibilities for a factory to be devoted to the canning and curing of fish, meat, and fruits, and the manufacture of fish and meat by-products.

* * *

The canning of fresh asparagus has been commenced at Bathurst, New South Wales, and the factory is now working at high pressure. When the season closes in December, the factory will commence the canning of apples.

* * *

Mr. C. S. du Mont, of Windsor House, Victoria Street, London, has completed a large installation of machinery for the packaging of jams, jellies, and preserves in the factory of Messrs. Kearley and Tonge, Southall. There are two complete lines of machinery. Each line consists first of a rotary bottle washer and rinser; then an automatic drying conveyor, the containers going from this drier directly into the Piston Type Visco Filling Machine, and from there automatically discharging on to conveyors that carry them to the capping operation and then storage or labelling. This plant has aroused a great deal of interest among the packers of jams and jellies.

* * *

During the 1926-27 season, fourteen beet sugar factories were actually engaged in the manufacture of home-grown sugar. Five new factories are planned for the next season.

* * *

The Secretary of the Canners' Association announced recently that 1,943,279 dozen tins of canned fruit were produced in Australia last season, of which 1,500,000 dozen tins were consumed locally, leaving 400,000, or about 30 per cent., for export. An agreement has been reached whereby growers of canning fruits will receive a minimum of £12 a ton from the canneries this season. An effort is being made to secure a higher price for apricots, which crop is generally light.

* * *

Of approximately 1,000,000 cwt. of tinned beef imported into the U.K. during 1926, about 77 per cent. came from the Argentine and 10 per cent. from Uruguay; about 6 per cent. came from Australia, and 2·6 per cent. from U.S.A., and 1·8 per cent. from New Zealand.

* * *

At least one-half of the fruit crop of the states of Morelos and Guerrero, in Mexico, is wasted, and plans are under way for establishing a canning factory. The local production of sugar will be an advantage.

* * *

We have received the following *Trade Catalogues*:

Andrew and Suter, 23, Goswell Road, Aldersgate, London, E.C.1.—Catalogue No. 49, describing Jager's Patent Can and Jar Filler, the "Extrajector," for viscous liquids and semi-solids.

The Premier Filterpress Co., Ltd., Finsbury Pavement House, London, E.C.2. Machines for canning foodstuffs under vacuum. The air is extracted simultaneously with the operation of seaming on or sealing of the lids or bottoms at high speeds. Another appliance is the "Mikro" Tin Plate Gauging Apparatus. These machines are stated to have been thoroughly tested and worked under practical conditions, and they are now in use in many factories both in this country and on the Continent.

Darcy Wentworth, 26, Victoria Street, London, S.W.1.—A pamphlet describing steam-controlled hot water heating and the Linfield Heater-Circulator.

Herbert Morris, Ltd., Loughborough.—An attractive and instructive booklet dealing with Morris Hand Overhead Cranes.

Enquiries

The following are extracted from letters we have lately received. We shall be glad to put interested parties in touch with the writers, or to insert replies in the Correspondence columns.

* * *

4. "I shall be pleased if you would give me the name and address of manufacturers of Red Sausage Colour, for butchers' use, which shall keep the meat a red, beefy colour when mixed with preservative powder (SO_2) or madam powder. The colour must comply with any Act now in force."

* * *

5. "Some time ago we procured from FOOD MANUFACTURE a working recipe for Lemon Curd, which we have found highly successful. Our confectioner customers are frequently asking us for another article known in the trade as Piping Jelly.

and we would be extremely obliged if you could furnish us with a working recipe for this article. Any confectioner could give you a sample (Messrs. Renshaw, Mitcham, being considered the best), but, if not procurable, we would endeavour to find a sample locally."

* * *

9. "Further, we have a good connection with confectioners for bottled fruits and jams, and have been asked several times of late for confectioners' Piping Jelly. So far we have not been able to secure a suitable formula for this commodity. Can you help us in the matter?"

* * *

— "Could you give me some idea how to make a good Salad Cream? I have plenty of good gum tragacanth, which, I believe, can be used in place of eggs to prevent the emulsion separating. I do not want to use eggs unless it is essential. I have also plenty of olive oil, citric acid, and acetic acid. I should want to make about ten gallons at a time. This product must be good, quality being more important than price. I would prefer using dried milk to fresh, if possible."

* * *

— "Would you also advise me how I could obtain information with reference to obtaining a quantitative analysis of the Pectin Content of a Fruit Juice in solution? We use Acetone for separation, but are not quite clear as to the filtering and drying methods usually employed. Also, how can I estimate the H-ions as represented by the symbol P of the same solution? We are busy with Orange Jelly Marmalade, and sometimes have trouble with an odd batch."

* * *

9. "We are makers of a line called Cokernut Jelly, and are having trouble now, and especially in the summer, through it going what we call mouldy. A green coat forms on the outside of each piece. Could you tell us the reason for this and how to avoid it?

"We are using ground gelatine. To 1 lb. we put 3 lbs. of water. The sugar and glucose is then boiled. When cooked it is allowed to stand for a few minutes to go off the boil, and then poured on top of the gelatine. Red colour, tartaric acid, flavour, and cocoa-nuts are then added, and the batch poured on to a cold-water plate to set. When ready it is cut up into pieces and boxed.

"If you can help us in this matter we shall be extremely obliged."

* * *

10. "As a subscriber to your journal, would you please let us know if an effervescing health salt in powder form should be heated or dried before bottling, and, if so, why? Also if there are any reasons against its keeping properties for tropical countries? We would be obliged if you could give us a sample formula for a health salt suitable for warm climates, and any hints as to packing in order that such a preparation might have good keeping qualities."

* * *

11. "Can you let us have the names and addresses of *makers* of a Cone Type Machine suitable for grinding almonds?"

Correspondence on Gelatine

TO THE EDITOR

DEAR SIR, *February 7, 1928*

Received the other day a copy of your FOOD MANUFACTURE journal, January issue. Am particularly interested in the item on Gelatine. Where the article treats of its usage in ice-cream, I am taking the liberty of giving you additional facts that are not brought out with sufficient clearness. In the first place, 1926 census showed there were 327,000,000 gallons of ice-cream made in U.S.A. There is approximately 22½ per cent. of gelatine used in every 500 gallons of ice-cream, and we figure the total consumption of gelatine in the ice-cream industry as 8,000,000 annually, as about 90 per cent. of all the ice-cream made in this country contains gelatine.

The article speaks of its advantages and disadvantages; it is all advantage to attach the use of gelatine to ice-cream. Gelatine acts as a stabiliser in ice-cream in that it keeps the component parts of the mix finely divided, prevents the separation of the butter fat, and solids not fat, from the water. Ice-cream can be made very palatable without the use of gelatine if it is served within twenty-four hours of the time of making, but if held beyond that period becomes very grainy and coarse, and is not comparable to the fine, smooth, wholesome ice-cream that is produced with the addition of so little as ½ of 1 per cent. of gelatine. There is more nearly ½ of 1 per cent. of gelatine used in ice-cream than ¼ of 1 per cent. as quoted. It not only lends a body and texture to the finished ice-cream but helps to retain that most desirable feature, and it is as essential in ice-cream that is dished in restaurants and hotels as it is in any that is served in the home.

It is wholly incorrect to say that if more than ¼ of 1 per cent. is used in ice-cream mix that it destroys the flavour, owing to the absorbing property of the gelatine. The edible gelatines that are made and sold in this country, complying with the United States pure food laws and as used by the ice-cream manufacturers, would not destroy the flavour or change it in the least, and to refer to it as is done in the article is wholly incorrect.

It is wholly wrong to refer to the usage of gelatine as a mask for inferior quality or age of the ingredients. It positively does not influence the making of ice-cream in that respect at all. None of its properties are such as to lend it to that usage. It acts as a stabiliser pure and simple, facts fully supported by the extensive research that has been carried on in U.S.A. for the last fifteen years. Bogues' work was done a good many years ago, and am pleased to enclose for your information a textbook on gelatine, put out by the Mellon Institute two years ago, treating entirely of edible gelatine, which refutes any ideas that it might be an adulterant or an inferior product used in the making of ice-cream. Won't you also refer to the passages on the value of gelatine combined with milk for infant feeding? That is a feature that is coming rapidly to the front in this country.

Yours truly,

L. B. EMOND,
Manager.

ESSEX GELATINE COMPANY,
BOSTON, MASS.

Commercial and Legal News

(The Editor does not accept responsibility for any errors which may occur in the following notices.)

London Gazette Information

Merchandise Marks Act.

Report on Currants, Sultanas, and Raisins.

The Standing Committee set up under the Merchandise Marks Act, 1926, by the Minister of Agriculture and Fisheries, the Secretary of State for the Home Department, and the Secretary of State for Scotland, have reported on their inquiry as to whether imported currants, sultanas, and raisins should be required to bear an indication of origin.

Copies of the Report can be obtained directly from H.M. Stationery Office or through any bookseller.

Reduction of Capital.

UNITED EGYPTIAN SALT, LTD. AND REDUCED. A petition presented to the High Court on October 31, 1927, for confirming the reduction of the capital of this company from £300,000 to £150,000 is directed to be heard before Mr. Justice Eve on February 20, 1928.

Voluntary Liquidations.

BRITISH BEET GROWERS, LTD. Resolved January 23 that the company be wound up voluntarily, and that Mr. E. J. Summers, 6, Broad Street Place, E.C., be appointed liquidator.

TRAFFORD PARK BACON FACTORY, LTD. Resolved January 12 that the company be wound up voluntarily, and that Mr. C. E. W. Lavender, 18, Exchange Street, Manchester, chartered accountant, be appointed liquidator.

FOODSTUFFS, LTD. Resolved January 17 that the company be wound up voluntarily, and that Mr. E. Oates, I.A., 371 to 377, Corn Exchange Buildings, Manchester, be appointed liquidator.

Meeting to Hear Liquidator's Report.

HOME DAINTIES, LTD. General meeting of members of this company will be held at 226 to 228, Bank Chambers, 329, High Holborn, W.C.1, on March 2 at 12 noon. Liquidator, T. D. Marshall.

Partnerships Dissolved.

LECKENBY AND CO. (Mary Hannah Leckenby, Harold Monkman, and Leonard Monkman), sauce manufacturers, Piccadilly, York. Mutual dissolution, November 1, 1927.

WARN AND SONS (Wm. John Warn, Chas. Edward Warn, and Horace Lisle Taylor), formerly carrying on business as brewers and maltsters, wine, spirit, and tobacco merchants, at Tetbury, Gloucester. Mutual dissolution as from December 31, 1927. Debts by Warn and Sons, Ltd., brewers, etc., of Tetbury, Gloucestershire, which company continues the business.

New Companies

The undermentioned particulars of New Companies recently registered are taken from the Daily Register compiled by Jordan and Sons, Ltd., Company Registration Agents, 116-118, Chancery Lane, London, W.C.2.

"ANGMERING-ON-SEA LIDO," LIMITED. (227100) Regd. January 5, 1928. 150, Southampton Row, W.C.1. To take over the bus. cd. on at Angmering-on-Sea as "Lido," and to carry on the bus. of contractors for the supply of refreshments, etc. Nom. Cap.: £1,000 in 1/- shares.

PARK LANE CONFECTIONERY COMPANY, LIMITED. (227195) Regd. Jan. 7, 1928. Weston Hill, Barry Dock, Glam. To take over the bus. heretofore cd. on at Barry as the "Park Lane Confectionery Co." Nom. Cap.: £3,000 in £1 shares.

HEAPS AND HEAPS, LIMITED. (227177) Regd. January 7, 1928. To carry on the bus. of mnfrs. of and dlrs. in confectionery, etc. Nom. Cap.: £100 in £1 shares.

PETER HUNTER, LIMITED. (227150) Regd. January 6, 1928. 47, Rusholme Road, Manchester. To carry on the bus. of wholesale and retail meat salesmen, etc. Nom. Cap.: £1,000 in £1 shares.

R. H. & R. J. BALDERSTONE, LIMITED. (227244) Regd. January 10, 1928. 164, Greengate, Salford. To take over the bus. of wholesale grocers now cd. on at Salford as "R. H. & R. J. Balderstone." Nom. Cap.: £6,000 in £1 shares.

EATONS, LIMITED. (227256) Registered January 11, 1928. 74, Albert Road, Widnes. To take over the bus. of a baker, confectioner, café propr., etc., cd. on at Widnes, as "C. A. F. Eaton" and "Eatons." Nom. Cap.: £5,000 in £1 shares.

WILKS' PIES, LIMITED. (227273) Regd. Jan. 11, 1928. Borough Bakery, Slaterfield, Bolton. To take over the bus. of a pie mnfr., baker, and confectioner cd. on at Bolton. Nom. Cap.: £3,000 in £1 shares.

YEAST-VITE, LIMITED. (227304) Regd. Jan. 13, 1928. 33, Paternoster Row, E.C.4. To acquire and hold 5,500 fully paid shares of £1 each in Irving's Yeast-Vite, Ltd. (being the whole of the issued share cap. of that co.), and to carry on the bus. of mnfrs. and sellers of patent medicines and proprietary articles, etc. Nom. Cap.: £360,000 in 1,200,000 pref. ord. shares of 5s. and 1,200,000 def. shares of 1s. Minimum subsn. 7 shares.

WILLIAM DORE, LIMITED. (227356) Regd. Jan. 14, 1928. To take over the bus. of a grocer and provision mcht. now cd. on at 340, Willows Lane, Bolton, and at 231, St. Helens Road, Bolton, as "William Dore." Nom. Cap.: £5,000 in £1 shares.

Societa Cioccolato and Affini U Corsini, Limited. (227663) Regd. Jan. 28. To carry on the bus. of mnfrs. of chocolates and confectionery, etc. Nom. Cap.: £1,000 in £1 shares. Minimum subsn., 7 shares.

Rose's Supply Stores (Kent), Limited. (227730) Regd. Feb. 1, 1928. 1, King Street, Dover. To take over the bus. of a wholesale and retail grocer and provision mcht. now cd. on at 56 and 58, King Street, Sandwich, Kent, as "Rose's Supply Stores." Nom. Cap.: £5,000 in £1 shares.

Arlette, Limited. (227715) Regd. Feb. 1, 1928. 150, The Parade, Sutton Coldfield, Warwick. To take over the bus. of a confectioner cd. on at 97, High Street, King's Heath, Birmingham, and 150, The Parade, Sutton Coldfield. Nom. Cap.: £1,000 in £1 shares.

I. C. Sanderson (1928), Limited. (227767) Regd. Feb. 2, 1928. Bank Street, Ashton-under-Lyne. To carry on bus. as bakers and confectioners, etc. Nom. Cap.: £500 in £1 shares.

H. Boorman and Company (Tenterden), Limited. (227594) Regd. Jan. 26, 1928. High Street, Tenterden, Kent. To carry on the bus. of grocers and provision dlrs., wine mchts., etc. Nom. Cap.: £20,000 in £1 shares (17,000 pref. and 3,000 ord.).

Stott and Bubbers, Limited. (227707) Regd. Jan. 31, 1928. 47, Minories, E.1. To carry on the bus. of grocers, provision, and genl. mchts., etc. Nom. Cap.: £1,000 in £1 shares.

Holland and Barrett, Limited. (227489) Regd. Jan. 21, 1928. 18, North Street, Bishops Stortford. To carry on the bus. of produce and provision mchts., grocers, etc. Nom. Cap.: £50,000 in £1 shares.

James Turner and Company (London), Limited. (227571) Regd. Jan. 25, 1928. 7, Quality Court, Chancery Lane, W.C.2. To carry on the bus. of provision mchts. and dlrs., etc. Nom. Cap.: £1,000 in £1 shares (750 pref. and 250 ord.).

Rutley Produce Company, Limited. (227741) Regd. Feb. 1, 1928. To carry on the bus. of mnfrs. of sausages and similar produce, etc. Nom. Cap.: £200 in £1 shares.

R. S. H. Syndicate, Limited. (227859) Regd. Feb. 6, 1928. 161-169, Cromwell Road, Earls Court, S.W.5. To carry on the bus. of proprs. of hotels and restaurants, etc. Nom. Cap.: £5,000 in £1 shares.

Campbell and Hart, Limited. (227820) Regd. Feb. 4, 1928. 11, St. Peter Street, Ashton-under-Lyne. To carry on the bus. of confectioners, etc. Nom. Cap.: £1,000 in £1 shares.

Colledge Roy and Company, Limited. (227819) Regd. Feb. 4, 1928. Brighton Street, Red Bank, Manchester. To carry on the bus. of mnfrs. and refiners of and dlrs. in oils, fats, and greases, starch and starch products, etc. Nom. Cap.: £1,000 in £1 shares.

H. C. Browning, Limited. (227894) Regd. Feb. 8, 1928. To carry on the bus. of bakers, confectioners, restaurant and café proprs., etc. Nom. Cap.: £4,000 in £1 shares.

Thomas and Hyslop, Limited. (227946) Regd. Feb. 9, 1928. 36, Dale Street, Liverpool. To carry on the bus. of grocers and provision mchts. and dlrs., etc. Nom. Cap.: £10,000 in £1 shares (5,000 pref. and 5,000 ord.).

Associated Catering Company, Limited. (227917) Regd. Feb. 9, 1928. 42, Broad Street Avenue, E.C. To carry on the bus. indicated by the title. Nom. cap.: £1,000 in £1 shares.

Burgon and Company (Liverpool), Limited. (227327) Regd. Jan. 14, 1928. To carry on the bus. of mnfrs., wholesalers and retailers of sweets, tobacco, and stationery, etc. Nom. Cap.: £5,000 in £1 shares.

Lowsbys Cafes, Limited. (227351) Regd. Jan. 14, 1928. 13, Victoria Street, Liverpool. To carry on the bus. indicated by the title. Nom. Cap.: £3,000 in £1 shares.

A. K. Houghton and Sons, Limited. (227358) Regd. Jan. 16, 1928. Ebenezer Bakery, Shorne, Kent. To take over the bus. of a baker and confectioner and corn dlr. cd. on at Shorne, Kent. Nom. Cap.: £2,000 in £1 shares (1,000 ord. and 1,000 pref.).

Chadwicks (Rochdale), Limited. (227398) Regd. Jan. 18, 1928. To carry on the bus. of mnfrs. of and dlrs. in aerated and mineral waters, etc. Nom. Cap.: £3,000 shares in £1 shares.

Bolton Direct Family Supply, Limited. (227429) Regd. Jan. 19, 1928. To carry on the bus. of mnfrs. of mineral waters and the like cd. on at Arkwright Street, Bolton, as the Bolton Direct Family Supply. Nom. Cap.: £7,000 in £1 shares.

Balfour, Limited. (227428) Regd. Jan. 19, 1928. 75 and 77, Marchmont Street, Tavistock Square, W.C.1. To carry on the bus. of bakers and confectioners, hotel keepers, etc. Nom. Cap.: £1,000 in £1 shares.

Eaton Hall Bakery Company, Limited. (227483) Regd. Jan. 21, 1928. 1, Brixton Road, S.W. 9. To carry on the bus. indicated by the title. Nom. Cap.: £1,700 in £1 shares.

Croxley Green Dairy Company, Limited. (227461) Regd. Jan. 20, 1928. 18, Bedford Row, W.C.1. To carry on the bus. indicated by the title. Nom. Cap.: £100 of 1s. shares.

Ash and Catherwood, Limited. (227454) Regd. Jan. 20, 1928. The Bakery, Hillingdon Heath, Uxbridge, Middlesex. To take over the bus. of bakers and confectioners cd. on at Uxbridge as "Ash and Catherwood." Nom. Cap.: £1,000 in £1 shares.

International Delicacies, Limited. (227506) Regd. Jan. 21, 1928. To carry on the bus. of retail and wholesale provision mchts, etc. Nom. Cap.: £2,500 in £1 shares.

Stabbacks Process, Limited. (227661) Regd. Jan. 28, 1928. To acquire the benefit of certain existing inventions and secret processes relating to the preservation of perishable commodities, etc. Nom. Cap.: £1,000 in £1 shares.

Current Literature

Fruit and Vegetable Products

The Influence of Temperature upon Yield and Quality of Peas. V. R. Boswell. (*Canning Age*, February, 1928, 122.)

Investigations of the Use of Fruits in Ice-cream and Ices. I. G. D. Turnbow and W. V. Cruess. (*Fruits Prods. Jour.*, January, 1928, 9.)

Spice Oils versus Spices in Food Products. F. W. Brown. (*Fruit Prods. Jour.*, January, 1928, 14.)

Electrical Conductivity of Peach Peeling Solutions. G. Pitman. (*Fruit Prods. Jour.*, January, 1928, 22.)

Improvements in the Processing of Salted Almonds. W. V. Cruess. (*Fruit Prods. Jour.*, January, 1928, 29.)

Chemical Changes Incident to Ripening and Storage in the Grimes Apple. F. Gerhardt. (*Plant Physiol*, 1926, 1, 251.)

Fruit Jellies. P. B. Myers and G. L. Baker. (*Delaware Agric. Exp. Sta. Bull.*, 1926, No. 141, 14; No. 144, 3.)

Detection of Apple Juice in "Pure Fruit" Conserves. C. F. Muttelet. (*Ann. Falsif.*, 1927, 20, 535.)

Influence of Method of Preparation on Chemical Composition of Preserved Peas. Lasausse. (*Ann. Falsif*, 1927, 20, 539.)

Corrosion and Perforation of Tin Cans. R. H. Lueck and H. T. Blair. (*Canner*, January 21, 1928 23.)

Tin Plate and the Electrochemical Series. E. H. Kohman and N. H. Sanborn. (*Canner*, January 14, 1928, 19.)

Vitamins in Canned Foods, VI.—Strawberries. E. F. Kohman, W. H. Eddy, and N. Halliday. (*Ind. and Eng. Chem.*, February, 1928, 202.)

Field Grading of Tomatoes for Canning. W. E. Lewis. (*Canner*, February 4, 1928, 9.)

Cereal Products

The World Wheat Situation, 1926-27. A Review of the Crop Year. (*Wheat Studies of Food Res. Inst. Stanford Univ., Cal.*, November, 1927, Vol. IV, No. 1.)

Wheat Conditioning. D. W. Kent-Jones. (*Arkady Rev.*, January, 1928, 10.)

The Relation of Flour Moisture to Bread Yield. (*Arkady Rev.*, January, 1928, 13.)

Starch in Flour. C. L. Alsberg. (*Cereal Chem.*, 1927, 4, 485.)

Value of Hydrogen-Ion Concentration and Buffer Value Determination in Testing and Use of Flours. C. G. Harrel. (*Cereal Chem.*, 1927, 4, 423.)

Use of Chromate Solutions as Comparison Standards for the Determination of "Gasoline Colour Values." H. Jorgensen. (*Cereal Chem.*, 1927, 4, 468.)

Determination of Flour Ash. J. Micka. (*Cereal Chem.*, 1927, 4, 461.)

Physical Properties of Washed Gluten. T. R. James and L. X. Huber. (*Cereal Chem.*, 1927, 4, 449.)

Heat Coagulation of Gluten. C. L. Alsberg and E. P. Griffing. (*Cereal Chem.*, 1927, 4, 411.)

Detection and Determination of Rice Flour in other Flours and in Spices. M. Wagenaar. (*Zeit. Unters. Lebensm*, 1927, 54, 357.)

Alcohol in Bread. V. Simpson and N. Knight. (*Am. Food Jour.*, 1926, 21, 423, 443.)

Protein Survey of the 1926 Minnesota Wheat Crop. R. C. Sherwood. (*The Northwestern Miller*, 1926, 148, 158*a*.)

Milling and Baking Studies with Wheat in North Dakota. C. E. Mangels. (*N. Dakota Sta. Bul.*, 1926, 194, 69.)

A Comparison of some Physical and Chemical Tests for Determining the Quality of Gluten in Wheat and Flour. D. A. Coleman, H. B. Dixon, and H. C. Fellows. (*Jour. Agr. Res.*, 1927, 34, 241.)

Dairy Products

Influence of Separation and Pasteurisation on Size and Distribution of Fat Globules in Milk and Cream. D. A. Beckett. (*Econ. Proc. Roy. Dublin Soc.*, 1927, 2, 303.)

Substitution of Janus Green for Methylene Blue in the Reductase Test for Milk. L. Soep. (*Le Lait*, December, 1927, No. 70.)

Estimation of the Age of Eggs by means of Ultra-Violet Fluorescence. J. van Waegeningh and J. Heesterman. (*Chem. Weekblad*, 1927, 24, 622.)

Various

The Fermentable Sugars of Malt. C. S. Wright. (*Jour. Inst. Brewing*, 1927, 151.)

The Standardisation of Oil for Mayonnaise. R. U. Norris. (*Oil and Fat Ind.*, November, 1927, 397.)

Chemical Aspects of Mayonnaise. D. M. Gray. (*Oil and Fat Ind.*, December 1927, 410.)

The Chemical and Physical Characteristics of Cod Liver Oil. A. D. Holmes and W. Z. Clough. (*Oil and Fat Ind.*, December, 1927, 403.)

The Chemical Composition of Spanish Olive Oil. C. S. Jamieson. (*Oil and Fat Ind.*, December, 1927, 426.)

Researches on Ammonia-Carbon Dioxide Compounds (Salt of Hartshorn), especially Ammonium Bicarbonate as Accelerators in Baking. T. Paul. (*Zeit. ang. Chem.*, December, 1927, 1539.)

Control of Temperature and Humidity of the Air in Meat Cooling Rooms. O. Henckel. (*Zeit. f. die gesamte Kälte-Ind.*, January, 1928, 1.)

Thermal Insulators. J. C. Peebles. (*Ice and Refrigeration*, January, 1928, 22.)

Modern Methods of Freezing Tank Operation. J. R. Bernd. (*Ice and Refrigeration*, January, 1928, 28.)

Inspection and Overhauling of Ammonia Compressors. W. D. Whaley. (*Ice and Refrigeration*, January, 1928, 29.)

Corrosion in Ice Plants. H. L. Lincoln. (*Ice and Refrigeration*, January, 1928, 31.)

The Selection of Cocoa Beans for Chocolate Manufacture. A. Schildberger. (*Mfg. Conf.*, January, 1928, 31.)

The Examination of Vanilla Beans. A. A. Lund. (*Mfg. Conf.*, January, 1928, 41.)

Manufacture of Prepared Mustard. P. H. McBride. (*Canner*, January 21, 1928, 53.)

Arsenic in Coated Papers and Boards. H. J. Stern. (*Analyst*, February, 1928, 83.)

Adulteration Statistics. J. F. Liverseege. (*Analyst*, February, 1928, 86.)

Vitamins and Brewers' Yeast. W. Singleton. (*London Brewing Trade Review*, July, 1927.)

Studies in Bottled Cocoa Beverages. J. B. Wilson, W. R. Turner, and J. W. Sale. (*U.S. Bureau of Chemistry; abs. Siebel Tech. Rev.*, October, 1927, 131.)

Comparison of the Content of Vitamin B in Fresh Yeast and in Dried Yeast prepared from it. A. Scheunert and M. Schieblich. (*Chem. Zelle u. Gewebe*, 1926, 13, No. 1, 79.)

Analysis

Estimation of Reducing Sugars. W. L. Whaley. (*Planter and Sugar Manufacturer*, January 21, 1928, No. 3, 41.)

Biological Evaluation of Food Preparations. E. Waldschmidt-Leitz. (*Zeit. Unters. Lebensm.*, 1927, 54, 291.)

Oil Bromide Films and their Use in Determining the Halogen Absorption of Oils. H. Toms. (*Analyst*, February, 1928, 69.)

Almond, Apricot-kernel, and Peach-kernel Oils. J. Pritzker and R. Jungkunz. (*Zeit. Unters. Lebensm.*, 1927, 54, 233.)

Accidental Green Coloration of Olive Oil. (Test for Copper in Water.) R. Marcille. (*Ann. Falsif.*, 1927, 20, 538.)

Determination of Extractable Materials in Coffee. A. Schugowitsch. (*Zeit. Unters. Lebensm.*, 1927, 54, 330.)

Rapid Test for an Excessive Amount of Lime in Ground Pepper. W. Plahl. (*Zeit. Unters. Lebensm.*, 1927, 54, 369.)

Preservation of Blood for Chemical Analysis by Use of Sodium Fluoride. J. H. Roe, O. J. Irish, and J. I. Boyd. (*Jour. Biol. Chem.*, 1927, 75, 685.)

Recent Patents

These particulars of New Patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office.

Latest Patent Applications

3672. J. P. CHALIHA: Drying, etc., tea. February 6.

3757. J. R. H. GRINSELL AND J. GRINSELL AND SONS, LTD.: Beverage mixers. February 7.

4390. S. HERMANN: Production of pastilles, etc. February 10.

3919. H. LANCASTER: Production of cream from milk. February 8.

3658. E. W. LEWIS: Power-driven food-mixing machines. February 6.

Specifications Published

284,748. G. J. WORSSAM AND SON, LTD. AND D. P. S. FOX: Apparatus for bottling beer or other liquid.

284,778. R. SELIGMAN: Removing incrustation formed on metallic surfaces which are in contact with hot milk.

284,788. BARRINGER, WALLIS, AND MANNERS, LTD. AND G. N. F. REDDAN: Tins or boxes for containing biscuits and the like.

271,066. NATIONAL EQUIPMENT CO.: Method and apparatus for tempering chocolate.

284,921. NATIONAL EQUIPMENT CO.: Confection-coating machines.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at the uniform price of 1s. each.

Abstracts Published

282,475. **Thick gravies.** E. M. ERSLEY (NÉE JORGENSEN), 60, Kwakkenbergscheweg, Nijmergen, Holland.

Sauces.—Thick gravies are given the flavour of beef, veal, mutton, game, fowl, etc., by addition of the fat therefrom, after it has been partly oxidised or treated with ultra-violet light. Alternatively, the volatile products obtained from the treated fat may be used. The gravies are prepared by boiling together water, flour, and a colloidal substance, such as gelatine, glue, casein, milk or whey, and emulsifying therewith the fat or fat products—*e.g.*, by whipping—so that the emulsion is stable when heated. Relishing substances, such as salt, pepper, mustard, curry, cream, lecithin, Japan soya, meat or yeast extract, sugar, caramel, aromatic essences, and the Norwegian cheese "Mysee Ost" are added.

282,480. **Drying liquids.** INDUSTRIAL WASTE PRODUCTS CORPORATION, 165, Broadway, New York, U.S.A.

Spray evaporators.—Waste syrups containing sugar, molasses, malt extracts, chromium tanning compounds, glue, etc., are dried to produce solid glass-like particles which are not hygroscopic by spraying the liquid, preferably preheated into a current of heated gas which carries the particles until sufficiently dried. The gas may be heated up to 1000° F.

282,105. **Sugar cutters.** CHAMBON, LTD., 23, Sandland Street, London.

A process for making loaves of sugar consists in breaking in the direction of their width slabs of sugar having a greater length than width and further breaking the pieces in the direction of the length of the slabs. Three slabs of sugar are fed to a known form of cutter which breaks the pieces along lines transverse of the slabs, the pieces being thereafter fed to a second cutter for breakage along longitudinal lines. The second cutter preferably comprises circular cutter blades separated by distance rings. Both cutting operations can be carried out in one or two machines.

282,178. **Starch food products.** W. D. STEIN, 2841, South Ashland Avenue, Chicago, U.S.A.

A starch conversion product for use in making bread, etc., is made by subjecting starch to the action of acetic acid and then to heat. Glacial acetic acid mixed with a small quantity of ammonium persulphate or methylamine sulphate may be sprayed upon powdered starch not having excessive moisture content, and the treated starch is then placed in a steam-jacketed converter, which may be connected with a condenser for the distillation of a portion of the acid. Specification 281,979 is referred to.

281,979. **Bread, etc., macaroni.** W. D. STEIN, 2841, South Ashland Avenue, Chicago, U.S.A.

Bread, cakes, and like baked foods, including macaroni, are made by adding to the flour the starch conversion product of Specification 282,178, making dough from the mixture, and baking. The dough may be made from 100 lbs. of flour, 57 lbs. of water, 1½ lbs. of yeast, 1 lb. of shortening, 1¾ lbs. of salt, 3 lbs. of the starch conversion product, and ½ lb. of malt extract. For straight-dough baking the dough is fermented, punched, proofed, panned, and then baked, but for a shorter time than usual: for a sponge method of baking, one-half of the starch conversion product may be put into the sponge and the other half into the dough.

279,722. **Drying fluid egg.** J. HUNTER AND J. McGOUGAN. May 4, 1927.

Film evaporators.—Fluid egg, etc., is concentrated and dried by introduction into a horizontal drum, which is rotated so that the fluid material is carried up the sides of the drum and then falls in a shower from the roof, heated air being introduced from a blower, having a directing nozzle so that the air first preheats the material on the sides of the drum and then passes through the shower. A battery of drums may be used into which air is blown from a number of nozzles mounted on a common blower provided with steam coils, a fan, and inspection door.

279,445. **Hormones.** I. G. FARBENINDUSTRIE AKT.-GES. October 17, 1927. (Not yet accepted.)

Hormones, influencing the action of the heart, which are soluble in water but not in strong alcohol, are obtained from the hearts of warm-blooded animals by extraction with water or with organic solvents, preferably under neutral or slightly alkaline conditions, ballast substances such as albumens and lipoids being removed from the extracts by known methods.

279,159. **Preserving food.** A. K. EPSTEIN. July 19, 1926.

Condiments; preserving liquid egg.—To enable liquid egg material, more especially egg yolk, to be frozen without impairing its emulsifying properties, an edible water-soluble organic hydroxyl compound capable of preventing denaturing of egg protein during freezing and an edible acid capable of increasing the water-imbibing capacity of the protein are added. The hydroxyl compounds used include glycerine, ethyl alcohol, ethylene glycol, sucrose, lactose, and dextrose. The acid employed may be acetic, tartaric, citric, lactic, malic, succinic, or phosphoric. In an example, glycerine and citric acid are mixed with yolk, and the product frozen solid in cans, a suitable temperature being – 10° to – 12° F., and kept solid until required. When the egg material is to be used in salad dressings or mayonnaise products as an emulsifying agent with vegetable oils, vinegar, spices, condiments, etc., a small amount of natural or synthetic mustard oil, oil of capsicum, or other essential oil having preservative and condimental properties may be added to prevent decomposition during thawing. The mustard oil may first be dissolved in a larger quantity of melted glacial acetic acid, monoacetin or other edible ester, ethylene glycol or other suitable solvent, which is then mixed with the other ingredients—*e.g.*, glycerine or ethylene glycol—to secure uniform dispersion of the oil in the egg product. In an example, powdered paprika (Capsicum Annum) is added to glacial acetic acid which is preferably heated. After filtering, a small amount of mustard oil is added to the filtrate, which contains the condimental ingredients and red colouring matter from the paprika, and it is then mixed with glycerine before addition to the egg yolk.

Recent Trade Marks

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal," and is published by permission of the Controller of H.M. Stationery Office.

KIRSEL

485,582. **Wheatmeal.** KIRBY'S (SELBY), LIMITED. Imperial Flour Mills, Barlby Road, Selby. February 15.

WILLERN

486,393. **Cereals (for food), fruits, and teas.** ARTHUR WILLIAMS, LIMITED, Halifax Place, Pilcher Gate, Nottingham. February 15.

FRISCOES

485,128. **A pop-corn mixture (for food).** FREDERICK WILLIAM BERWICK, 51, Arcade House, Old Bond Street, London, W.1. February 15.

DOUBLE LUCK

474,203. **Canned, dried, or bottled fruits, canned fish, canned meat, and canned vegetables.** CALIFORNIA PACKING CORPORATION, 101, California Street, City and County of San Francisco, State of California, United States of America. February 15.